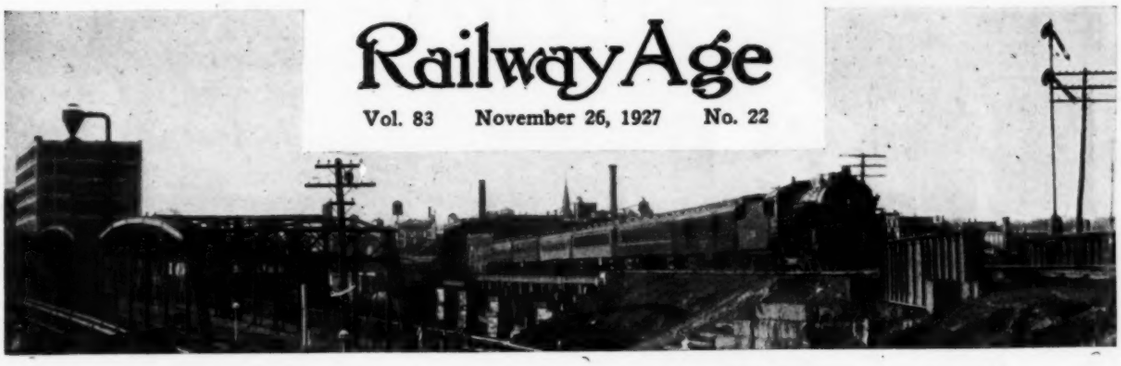
Railway Age

Vol. 83 November 26, 1927 No. 22



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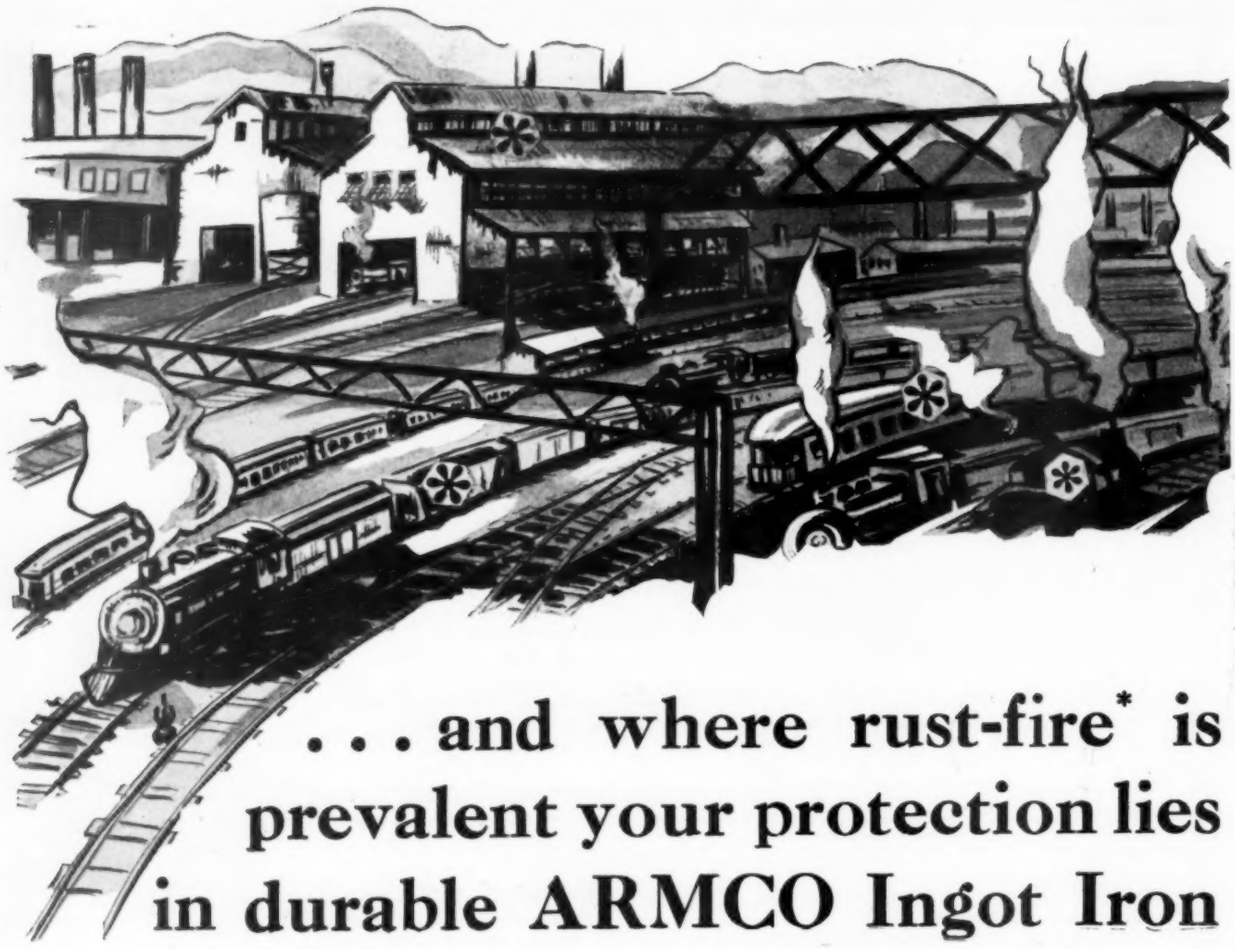

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Railway Age

Vol. 83, No. 22 November 26, 1927

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More About "Maintrackers"

IN the interest of increased operating efficiency, many railways have adopted the "maintracker" system of freight train operation to at least some degree. On the Lehigh Valley, as described elsewhere in this issue, the principle has been carried to the extent of scheduling all freight trains as carefully as passenger trains, and specifying, through instruction books, just what the consist of each train shall be. One of the outstanding results has been a 45 per cent increase in the average miles per car per day in five years. All of the other operating factors have shown improvements as well. The Lehigh Valley has also found that "maintracking" has made it possible to handle a record business economically and efficiently without large capital expenditures for increased yard facilities, and with decreased yard expense and a reduction in road overtime. The experience of the roads which have installed a complete and thorough "maintracker" plan indicates that it can be done with relatively little expense, and amply justifies itself by the savings and improvements effected. The installation of such a plan is practicable on almost any railway. In this connection, the descriptions of similar installations on the Baltimore & Ohio, appearing in the *Railway Age* of August 6, 1921, page 254, the Chicago, Burlington & Quincy, May 12, 1923, page 1140, and the Rock Island, February 19, 1927, page 515, in conjunction with the Lehigh Valley plan, afford an interesting comparison of methods and results on roads with widely varying physical and operating conditions.

The D. & R. G. W. an Outstanding Railway Bus Operator

IN a quiet way the Denver & Rio Grande Western is building up one of the largest as well as one of the most successful systems of railway motor bus lines in the country. Operating in a part of the country where the physical characteristics are such as to render the furnishing of any kind of transportation an expensive proposition, it is meeting the problem of declining traffic through the provision of transportation service at the minimum cost by the operation of motor buses and trucks. The D. & R. G. W. operates a number of narrow gage branch lines in Colorado through territory which at best has never contributed much traffic. With the advent of good roads paralleling these branch lines, it has seen more and more of such traffic as was available going to the highways. To meet this situation it is itself operating on the highways, and with marked success, abandoning its railway lines where possible. Its first bus line, operated jointly by the D. & R. G. W., the Colorado & Southern, and the Atchison, Topeka & Santa Fe, extended from Denver to Pueblo, and its purpose was not to replace train service but to supplement it. Its more recent bus and truck lines have centered around Grand Junction, Salida, Alamosa and other points in the interior of Colorado, most of these replacing train service. At the present time, the D. & R. G. W. has a system of approximately 500 miles of bus and truck lines and its expansion is still under way. Not only has it reduced the losses incident to its train operations on a number of its branch lines, but it is, in fact, showing an excellent return on its investment in the operation of its buses and trucks. Its operations afford a good example of how losing railway lines can be turned to profit producers.

Cotton and Freight Claims

THE proper handling of cotton shipments affords the superintendents another opportunity to co-operate effectively with the freight claim officers. At first glance, it would seem that cotton would be a commodity but little subject to loss and damage, but this is not the case. During the past season, at the Texas ports of Texas City, Houston and Galveston alone, more than 15,000 O. S. & D. reports were rendered on cotton shipments. Other ports made similar showings. Practically all of these were due to errors at the point of origin, such as poor marking, incorrect billing, checking and loading. When freight claims in general are decreasing, an increase in cotton claims is all the more outstanding. A bale of cotton is a large, bulky object and should not easily become lost or stolen. A cotton claim prevention congress has been organized to combat this growing waste, but superintendents also may aid materially in reducing cotton claims. If the operating officers in cotton-loading territory will exercise active supervision over the station forces at cotton-shipping stations, much of this needless waste of time and money at the ports and other points of destination may be avoided. The loss inevitably reverts to the division making the mistake in the first place and reflects upon its operating efficiency.

The Safety of the "19" Order

THERE has been endless discussion pro and con on the subject of the relative safety of the "19" and the "31" order. The real test is that supplied by actual operation. The Northern Pacific has made such a test over a period of several years. Operating trains on this railway involves all the hazards that are to be found elsewhere, with the additional handicap of stormy and bitterly cold weather in the winter time. The Northern Pacific has been running its trains for some years under the protection of the "19" order exclusively and, on April 1, 1926, the "31" order was eliminated from its

rule-book entirely. While many other roads have abandoned the "31" order; the Northern Pacific was one of the first to eliminate it from its rules. It is interesting and significant to observe that the Northern Pacific not only maintains a high standard of safety in train operation, but also, since the "31" order has been abolished, there have been no accidents that could, by any stretch of the imagination, be charged to failure of the "19" order to function properly.

Continued Increase in Operating Efficiency

IN spite of the decline in freight business within recent months the railways have continued to make new records of operating efficiency. The most notable one made in September, the operating statistics for which have just become available, is with respect to the amount of service in actually handling freight rendered by the average train hourly. The number of ton-miles of freight service rendered by the average train hourly was 9,967. This compares with the high record for 1926 of 9,876 ton-miles which was made in August of last year. The principal reason for the new high record of freight service rendered hourly by the average freight train in September was that the average number of freight cars in each train was 48, this also being a record surpassing any previously made. It is significant that in each of the first nine months of this year the average number of cars per train was larger than last year; that in spite of this the average speed made per freight train was greater in each month than last year; that the number of tons of freight handled per train was larger than last year in six out of nine months; and that, due to this combination of causes, the amount of service rendered by the average freight train in handling freight was larger than last year in seven out of the first nine months of the year. The net operating income earned by the roads was smaller than last year in seven out of the nine months, but the facts show this was due to advances in wages, reductions of rates and losses of passenger business, and occurred in spite of continued increases all along the line in operating efficiency.

Commissioners Agree "In Part"

WHEN the Interstate Commerce Commission fixes a freight rate it is probably the natural assumption of the public, to the extent in which it may be interested in the subject, that eleven expert and disinterested commissioners, or a majority of them, have substituted their expert or disinterested judgment for that of the railroad officers, who, regardless of their degree of expertness are supposed to be influenced more or less by selfish motives. The result is therefore naturally accepted as the correct one, until the conditions change, or the commission changes its mind, either because of a change in the make-up of the commission or for other reasons. Then the public mind is likely to become somewhat confused on the subject, as indicated by some of the discussions frequently heard of the pending lake cargo coal rate case, in which the commission issues a new decision every two or three years. However, that many important rates are decided by much less than a majority of the commission, and that the result often depends greatly on the element of chance as to which group of commissioners happens to deal with a given case, is strikingly illustrated by the recent decision denying the application of the transcontinental railroads for authority to reduce the rate on canned goods from California to points east thereof from $1.05 to 90 cents per hundred pounds, for the purpose of meeting the competition of intercoastal lines operating through the Panama canal at a rate of 45 cents. The Interstate Commerce Commission is so burdened with work that most of its cases are now handled by divisions of three commissioners. This case was decided by Division 1, consisting of Commissioners Aitchison, Lewis and McManamy. Commissioner Lewis, who is named as the author of the report, a fifteen-page document bristling with all the technical detail that is supposed to govern the fixing of a freight rate, held that while at the $1.05 rate the carriers are laboring at a disadvantage in competing with the water lines, the record indicated that the 90-cent proposed rate is lower than necessary to meet the competition in a reasonable degree. Commissioner McManamy, "concurring in part" agreed with him to the extent of the finding that the proposed rate had not been justified. Commissioner Aitchison, "dissenting in part" felt that the proposed reduced rate had been justified, but in view of the finding of the majority to the contrary said he had lent his vote to a requirement that the tariff schedules be cancelled, without prejudice to the filing of a rate of 98 cents. One commissioner believes 90 cents is a proper rate, another that 98 cents is and another that it should not be less than $1.05. What rates might not have been suggested if the other eight commissioners had had a chance?

Renewed Interest in Stationary Power Plants

THE records that the railways have made in fuel economy in locomotive operation during recent years are such as operating and mechanical officers can justly be proud of, but such remarkable progress suggests at the same time the possibility of similar savings at stationary power plants. The suggestion that the railways can well afford to pay more attention to their steam plants is prompted by the desire to reduce as much as possible, the consumption of fuel for *all* power purposes. There seems to be little doubt in the minds of those who have given serious thought to the matter, that the railroads will be well rewarded if better stationary plant supervision is effected and if obsolete plants are revamped to bring their fuel consumption down to a more economical value. Possibly the best solution to the problem of cutting stationary plant power costs is that suggested in the report of the Committee on Power Plants of the Association of Railway Electrical Engineers at its recent convention. This committee, recognizing that the power plant problem is essentially an economic one and, therefore, one that must be solved finally by the railroad managements, suggested that any railroad of considerable size "should have a power plant supervisor, who should be the engineering and operating head of all plants." His duties would include frequent checks of the fuel consumption and relative efficiencies of plants, and he should conduct operating tests at regular intervals and instruct station operators, rating them according to their plant performances. This recommendation merits

the serious study of railway officers. The idea is not a new one but is well worth repeating because few roads have yet created such a position; the Chicago, Burlington & Quincy and the Missouri Pacific have such a system officer. It should be remembered in conclusion that the controversial subject of railway plant versus purchased power will assume a new aspect if more economical operation of stationary plants is attained.

Railway Competition in Rate-Making

RECENTLY the highest executive officer of an important railway system said an investigation he had been making had led him to the conclusion that in number and importance the downward "readjustments" of freight rates voluntarily made by the traffic officers of the railways recently exceeded in number and importance those made by regulation. He remarked that this was a result of competition by the railways for business of traffic officers of individual railways seeking to get advantages over competing railways; but that when an individual line made a reduction for competitive reasons it usually was met by other lines, with the result that each of the railways concerned had its earnings reduced.

The president of a large railway in this connection called attention to the fact that if an expenditure of any importance for improving and enlarging the physical property of a railway was proposed it would be brought to the attention of the president before being decided upon. If any important change in operation or service was considered it probably would be brought to the attention of the president before being made. On the other hand, he remarked, rate-making is treated as something so complicated and mysterious that it can be handled only by expert traffic men, and in consequence, important changes in rates that substantially affect a railway's earnings often are made of which its president first hears when he reads about them in the newspapers.

We are reminded of these recent comments of executives of two important railway systems by statistics of railway freight traffic and earnings for the first nine months of 1927. These statistics show, first, that in these months the net ton mileage of the Class I railways was slightly greater than in the corresponding months of 1926. They show, secondly, that the earnings from freight business in these nine months of 1927 were about $46,400,000 less than in the corresponding part of 1926. Of course, this decline of freight earnings was entirely due to a reduction of average revenue per ton per mile. It seems probable that in the entire year 1927 the decline in freight earnings due to reduction of average revenue per ton per mile, as compared with that received in 1926, will amount to $65,000,000.

The average annual increase in property investment since 1922 has been about $800,000,000. Therefore, the decline in freight earnings in 1927 due to reduction of the average revenue per ton per mile apparently will be equivalent to a return of about eight per cent on this average annual investment. There has been no general reduction of rates since 1922. In 1923, the first year throughout which the general reductions made in 1922 were in effect, average revenue per ton per mile was 1.116 cents. In the entire year 1927 it will apparently be approximately 1.07 cents. This decline in average revenue per ton per mile between 1923 and 1927, applied to the freight business of 1927, will result in a loss of freight revenues of about $225,000,000. The net increase in property investment in 1927 over 1922 will be about $3,900,000,000. Therefore, the loss of freight earnings in 1927 due to reduction of average revenue per ton per mile since 1923 will be equivalent to a return of almost 6 per cent on the entire increase in property investment since 1922.

There is no reason to believe that the operating expenses and taxes of the railways would be any greater than they are at present if there had been no decline in average revenue per ton per mile. This being the case, it follows that whatever reductions of total earnings have been caused by reductions of rates that have contributed to the reduction in average revenue per ton per mile have been entirely at the expense of the net operating income of the carriers. To what extent has this loss of net operating income actually been due to "readjustments" of rates made by the Interstate Commerce Commission, and to what extent to downward "readjustments" made voluntarily by the traffic officers of the railways to which the railway executive above quoted referred?

Not long since the traffic officers of a large group of railways met to consider advances in the rates upon certain commodities moving in large volume, the earnings from which long have been generally conceded to be unremunerative. The commodities in question are produced almost entirely by a few big shippers, and it was obviously desirable that a tentative agreement should be reached by the carriers before these big shippers should be advised of what was going on and thereby given opportunity to begin using the "big stick" of traffic on individual lines. The big shippers were, however, given prompt warning by somebody, their "big stick" was immediately brought into use, and no agreement to propose an advance in their rates has yet been reached. The history of rate-making, even that of recent years, is replete with incidents of this kind.

What these facts all signify is that, contrary to statements that are repeatedly made, and to a generally prevailing opinion, there is still active competition between railways in rate-making. It is unquestionable that there still are and always will be many cases in which the railways, in order to remove discriminations or develop traffic, should take the initiative in reducing rates. But to what extent does the initiative now taken by them in reducing rates have the effect of increasing traffic and earnings, and to what extent does it have only the effect of reducing earnings?

Another question that may well be asked is as to the extent to which competition between them prevents them from acting unitedly to secure advances in rates that ought to be made. This at present is a question of especial importance. One of these reasons is the Hoch-Smith resolution, which contemplates reductions of rates on some commodities and advances on others. The Interstate Commerce Commission already has made some reductions which have been attributed to the Hoch-Smith resolution, and may make others. Can the traffic officers of the railways subordinate competitive considerations to the plain demands of the situation, agree upon advances that should be made, and then stick together regardless of the pressure of shippers?

Apparently, in this connection, much significance should be attached to certain things said by Chairman Esch of the Interstate Commerce Commission in his recent letter to President Johnson of the Railway Business Association, (*Railway Age,* November 12, pages 936-938). Mr. Esch implies that the commission expects the railways to take the initiative in seeking such

advances of rates as they believe should be made. The Transportation Act and the Hoch-Smith resolution plainly impose upon the commission, as well as the carriers, the duty of "initiative" in such matters, but experience, as well as Mr. Esch's letter, indicate that whoever may take the initiative in seeking reductions of rates, the carriers, almost without exception, will have to take it with respect to advances.

The situation very plainly imposes great responsibilities and duties primarily upon the traffic executives of the railways, but also upon the presidents, chairman and boards of directors. Surely it must be recognized some time that, under the conditions created by regulation, railway earnings cannot be adequately safeguarded unless in rate-making competition is subordinated by the railways to co-operation. In the long run, the prosperity of each railway will be determined much more by the general level of rates in its territory than by the usually ephemeral and illusory advantages sought by individual lines through attempts to gain territorial advantages or curry favor with big shippers by favoring or opposing changes in rates in disregard of the effects that may be produced upon the earnings of entire groups of railways.

Traffic Type or A.R.A. Standard Highway Crossing Signals

CONSIDERABLE controversy has arisen lately regarding the extent to which the railroads should accede to the demands of city authorities for the installation of regular street traffic light signals to protect grade crossings in cities in preference to the American Railway Association Signal Section standard flashing-light or wig-wag. In Orlando, Fla., where the Atlantic Coast Line crosses 22 streets at grade, traffic-type signals, similar to those used at street intersections throughout the city, have been installed and are controlled electrically by men in towers, so located as to afford a view of approaching trains. In Beaumont, Tex., the Atchison, Topeka & Santa Fe has installed traffic-type signals at ten crossings, while signals of the same type have been installed by other roads, including four by the Southern in Memphis, Tenn., and several by the New York Central at Syracuse, N. Y. It is reported that these signals are very effective, especially where the street traffic is heavy, under which condition gates are lowered with difficulty and flagmen on foot cannot stop the traffic.

Some prominent signal engineers take the position that if the A. R. A. standard signal is used at all railroad crossings of highways outside of cities where highway commissioners have jurisdiction, it is best to comply with specific requests of city authorities to use the traffic-type signal inside cities, where police protection will insure strict observance of the signal. One engineer is of the opinion that the A. R. A. signal should be used in all but exceptional cases such as street intersections at or near a railroad crossing, in which case the traffic-type signal will eliminate confusion. Other signal engineers, who are perhaps in the majority, favor the use of the A. R. A. signal exclusively.

The average automobile driver is becoming more and more accustomed to observing the A. R. A. standard signal, not only as information that he is approaching a railroad but, if operating, as a reliable indication that a train is approaching. If traffic-type signals are used at railroad crossings, a driver will not be warned that he is approaching a railroad, with the result that the A. R. A. standard may, to a certain extent, lose effectiveness as an exclusive indication for a railroad crossing.

The idea that the traffic-type signal should be used where streets cross railroads is based on the fact that the average automobile driver is trained to observe traffic signals under penalty of the law, whereas no penalty is attached to non-observance of the A. R. A. standard signals. However, it is contended that the majority of the public observe these A. R. A. signals of their own volition, while the traffic-type signals are observed because of police enforcement and if this enforcement becomes lax, the average driver, during periods of light traffic or on comparatively unimportant streets, will disregard the traffic signal and, if a train is approaching, meet with an accident. Another objection advanced by many railroad officers is that the traffic signal gives a "green" or "go" indication to the automobile driver which is contrary to established crossing protection practice with flagmen, gates, or the standard A. R. A. automatic crossing signals of either the wig-wag or flashing-light type, all of which leaves the responsibility for proceeding on to the tracks up to the driver, which results in cautious action on his part.

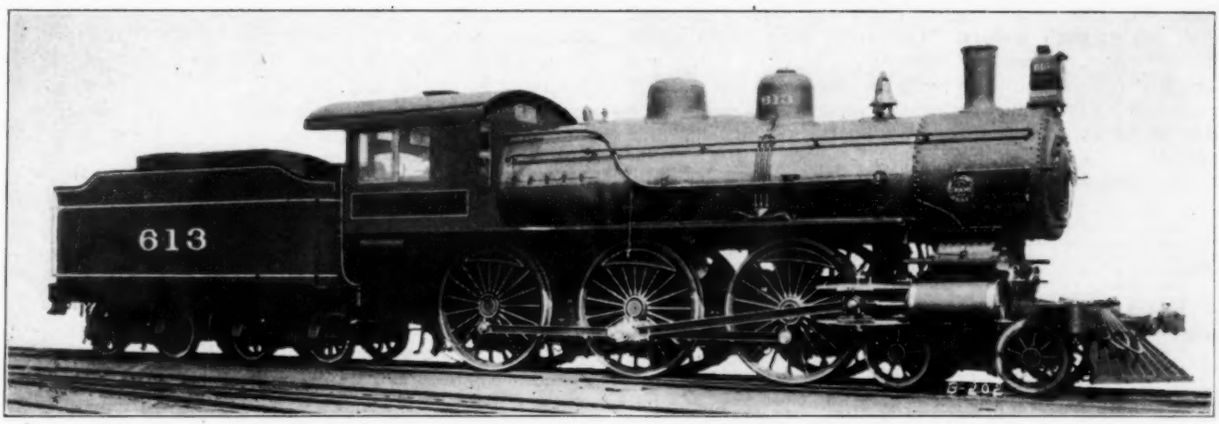
In brief, it seems evident that the traffic-type signal has a useful field in cities where street traffic is heavy and drivers are accustomed to obeying their indications. However, their success depends on confining their use to the specific locations mentioned. In general the railroads should adhere to the A. R. A. standards.

Younger Men's Conference

WHILE the fifth annual meeting of the Younger Railroad Men's Conference had the same general objectives as the previous conferences and was conducted along much the same lines, it did show rather distinct improvements in several directions. In the first place, the younger railroad men have been steadily assuming a greater and greater responsibility in the preparation of the program. The tendency has been to reduce the number of addresses and provide for more group discussions, thus making it possible for every member of the conference to take more active part in its proceedings. The breaking up of the large conference into comparatively small discussion groups has also had a tendency to intensify and develop the discussions along those lines which make the greatest appeal to the particular groups.

An effort was made in the earlier conferences to cover too much ground, and this resulted in overloaded programs. With a better balanced and less crowded program it has been possible to cover the ground much more thoroughly, and the young men have apparently gone back home with more distinct impressions and well developed ideas. More and more emphasis has been placed on the question of vocational guidance. The young men have also secured a larger vision of the possibilities of life work in railroading and a higher appreciation of the dignity of their tasks.

One very practical result of the conferences has been the formation of a large number of American Railway Employed Boys' Clubs, thus multiplying the number of young men who are being benefited. The purpose of these clubs is to bring together representative young men for the discussion and study of their common problems. An important part of the programs of such clubs is to invite officers and supervisors to address them and to answer questions. This has brought about more intimate relationships and better understandings between the younger men and their superiors.



A 4-6-0 Type Passenger Locomotive Built in 1900—Cylinders, 20 in. by 28 in.; Diameter of Drivers, 80 in.; Boiler Pressure, 200 lb.; Tractive Force, 23,800 lb.; Total Weight, 172,500 lb.

The Locomotive Yardstick*

Analyze operating conditions and then proportion the locomotive to meet the requirements

By A. W. Bruce
Designing Engineer, American Locomotive Company, New York

A RAILROAD is nothing more than a commercial manufacturing plant, whose only product is transportation, and in which the locomotive is the only direct revenue producing unit. It immediately becomes apparent that we must apply the same rule for economical production to the railroad that we would apply to any commercial plant. We all know that the success of present day industry has been due to large production at low unit cost. The sooner we learn to apply this to railroad operation and the sooner we make up our minds to scrap obsolete power and to substitute new power of modern design the sooner we can hope to pay suitable dividends on our initial investment.

I realize perfectly the enormous amount of capital represented in motive power equipment. What other manufacturing industry, however, could be carried on competitively, using continuously machines 20 to 25 years old in the manufacture of its product?

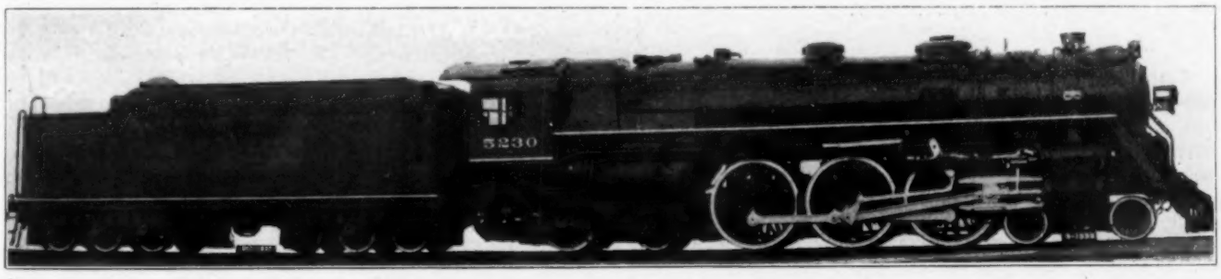
There is also the danger that in retiring first line power to secondary lines, we will have an uneconomic operating unit. Locomotives, like any other machine, must be designed for their particular service in order to produce the best returns.

The importance of doing just this thing becomes more obvious, when we realize that we are still operating many locomotives in service, which average little better in performance than some of the locomotives built about 25 years ago. From a strictly modern locomotive having the same number of drivers, we might reasonably expect to obtain results something like 3,000 to 4,500 or even 5,000 maximum i.h.p., coal consumption 2 to 3 lb. per i.h.p.-hour, a steam consumption of 17 to 18 lb. per i.h.p., and sustained maximum power at high speed.

The Development of Passenger Power

The 4-6-0 type locomotive in use about 1900 has 80-in. driving wheels and 200-lb. boiler pressure, but developed only 23,800 lb. tractive force with a relatively small boiler and narrow firebox. The 2-6-2 type passenger locomotive permitted a much larger boiler, with increased tractive force and weight. The 4-6-2 type was a development from the 2-6-2 type due to the fact

*Abstract of paper presented at the November 21, 1927, meeting of the Western Railway Club, Chicago.



A 4-6-4 Type Passenger Locomotive Built in 1927

Cylinders, 25 in. by 28 in.; Diameter of Drivers, 79 in.; Boiler Pressure, 225 lb.; Engine Tractive Force, 42,300 lb.; Booster Tractive Force, 10,300 lb.; Total Tractive Force, 53,200 lb.; Total Weight 346,500 lb.

that the four-wheel engine truck had better guiding qualities at high speeds. The 4-6-4 type has a much larger boiler, a marked increase in tractive force and weight, and is equipped with modern accessories. It represents about the maximum capacity obtainable with this wheel arrangement and within the permissible axle loads.

Fig. 1 shows the characteristics of a 4-6-0 type loco-

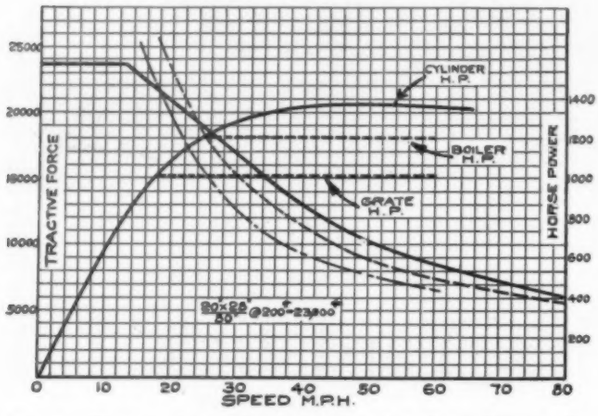


Fig. 1—Characteristic Curves of a 4-6-0 Type Locomotive Built in 1900

motive built in 1900 that is typical of any narrow firebox saturated steam locomotive. The first dotted lines below the tractive force curve show the reduction due to lack of sufficient boiler capacity. The second or lower dotted lines show the further reduction due to the restricted grate area of the narrow firebox. Fig. 2 shows the result of the development in the three-coupled locomotive design since 1900. The dotted lines show how much by actual test the designers have been able to ex-

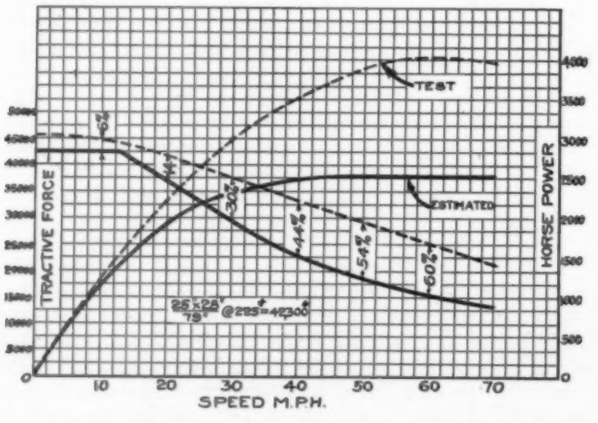


Fig. 2—Characteristics of a 4-6-4 Type Passenger Locomotive Bu lt in 1927

ceed the old standards through the working range of high speed passenger service. This increase is entirely due to the greater steaming capacity made possible through the application of a larger boiler, mechanical stokers, improved superheater, feedwater heater and other accessories, the additional weight of which is chiefly absorbed by the 4-wheel trailer truck.

Fig. 3 shows comparative diagrams of a 4-6-2 locomotive built in 1907 and the 4-6-4 type built in 1927. We can assume that both types are still in service. Note the comparatively small increase in the weight on the drivers as compared with the increase in the total weight and tractive force. A comparison of the characteristics of the 4-6-2 and 4-6-4 types, the diagrams of which are compared in Fig. 3, are shown in Fig. 4. The wide gap between the tractive force and the indicated horsepower curves for these two locomotives, represent just one thing; namely, power output at speed.

Development of Freight Power

In the 2-8-0 type built in 1912, we see this type of locomotive developed to its final stage with this wheel arrangement. While it might have been possible to go a little further with this type, its limitations were too obvious to warrant the expense. The 2-8-2 type has been probably the most successful wheel arrangement ever used for all around freight service. It is, however, beginning to fall back at this time because of insufficient boiler capacity. The 4-8-2 type is one of the best wheel arrangements for high sustained power that has been developed up to the present time. With a wheel diameter to suit, it is readily adapted to either freight or to passenger service. Where exceptional power is required, a four-wheel trailing truck may be used equally well.

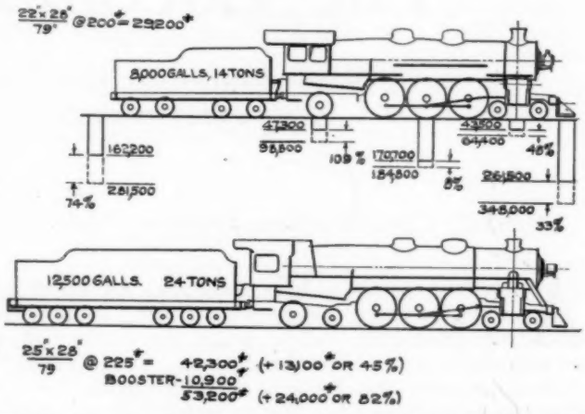


Fig. 3—Comparative Diagrams of a 4-6-2 Type Built in 1907 and the 4-6-4 Type Built in 1927

The characteristic curves for a typical example of a 4-8-2 type locomotive built in 1927, are shown in Fig. 5. The increase in the tractive force and indicated horsepower cylinder curves, as shown by the dotted lines, taken from actual test data, is due entirely to greater steaming capacity.

Fig. 6 shows the comparative diagrams for a 2-8-2 type locomotive built in 1913 and a 4-8-2 type built in 1927. These diagrams are representative of the majority of Mikado type locomotives operating daily over the railroads of this country. Note the results in tractive force that have been obtained with the increase in weight of 13 per cent on the drivers.

The comparative characteristics of the locomotives shown in Fig. 6 are plotted in Fig. 7. Again the difference between these two locomotives represents capacity only. The final result in the case of freight locomotives is measured in ton-miles instead of in the number of cars in a train as for passenger locomotives. Fig. 8 shows a comparison of the average gross ton-miles made by a 4-8-2 and a 2-8-2 type locomotive over the same division. This certainly justifies the use of the 4-8-2 type locomotive wherever speed limitations permit. The advantages of steaming capacity and large driving wheels together with increased tender capacity, are obvious.

With the older locomotives we were faced with many

limitations which have since been removed. Chief of these was the amount of coal which it was humanly possible for one man to handle continuously and the further general inability of the locomotive boiler to maintain sufficient steam supply to the cylinders. With the mechanical stoker, improved superheaters and other devices, however, we are now able to lift the tractive force-speed curve, so as to approximate very closely the theoretical hyperbola of continuous power output. It also reduces locomotive design to a much more definite basis. The demand for more rapid and continuous transportation, together with the constantly rising cost of fuel, operating labor and maintenance items, we face the necessity of providing an entirely new yardstick for reference, instead of the well-known two-foot rule which has served us so long, and in some cases so well. Locomotives in the past, if they met their maximum tractive force requirements in starting, and came somewhere near meeting their weight limitations, were in general considered

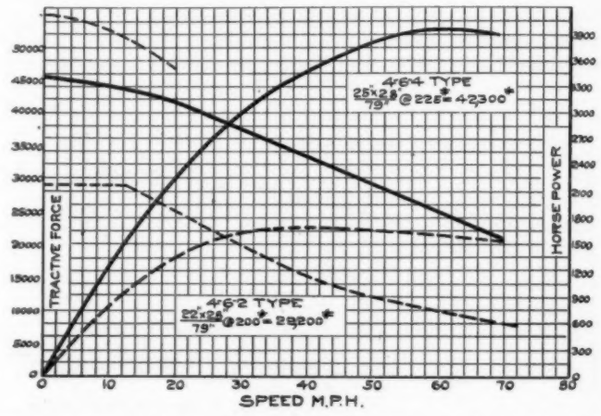


Fig. 4—Comparison of the Characteristics of the 4-6-2 and 4-6-4 Types shown in Fig. 3

to have satisfactorily met the two-foot rule requirement.

The modern locomotive is still subject to the two-foot rule requirement of tractive force for starting trains. Beyond this point, however, we apply today the yardstick of indicated horsepower which is the true measure of work performed by any prime mover, no matter what form it may take. This same horsepower unit appears again under the name of "gross ton-miles per hour," along with the corresponding measure of locomotive efficiency—"coal per thousand gross ton-miles."

The difference in the two standards of measurement is perfectly simple. The older tractive force standard is indefinite, as it makes no allowance for time or distance. The modern standard is both accurate and definite, in that it defines a certain amount of work to be done within a certain definite period of time. The definition of the term horsepower is "a unit of measurement for the rate of doing work." The importance of measuring locomotives by this standard will appear from the

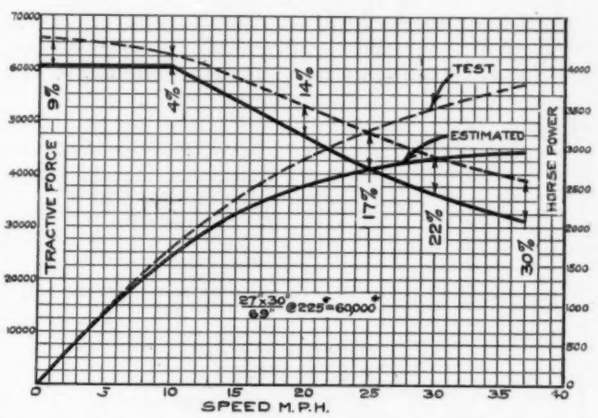


Fig. 5—Characteristic Curves for 4-8-2 Type Locomotive Built in 1927

following actual returns covering two types of locomotives on a western road.

Because of profile limitations this railroad had been using 2-8-8-0 type Mallets and had considered them very satisfactory until receipt of some three-cylinder 4-12-2 types of about the same tractive force. The Mallets were considered one of the most successful designs in its class for use over an undulative profile, until operating speeds increased to a point beyond its limit. The three-cylinder 4-12-2 type was designed to handle the same tonnage at much higher speeds. While this locomotive has a 30 ft. 8-in. driving wheel base, the front and rear axles are arranged with lateral motion devices, enabling it to pass around curves without difficulty. In actual service on 1½-per cent grades, the 4-12-2 type has handled the same trains as the Mallet, at higher speeds and with less coal.

On 0.8 per cent grades the 4-12-2 type shows 80 per cent more ton-miles per hour on about 50 per cent of the Mallet fuel consumption per 1,000 gross ton-miles.

Another more recent striking example is that of an eastern road, which received in 1916, for use over a difficult undulating division some of the largest and most powerful 2-10-2 type locomotives, built up to that time and which were continued in service until the receipt in 1927 of some 2-8-4 type locomotives. These were equipped with trailer truck boosters and have approximately the same tractive force, in spite of the fact that

A 2-8-4 Type Freight Locomotive Built in 1927

Cylinders 28½ in. by 32 in.; Diameter of drivers, 70 in.; Boiler Pressure, 225 lb.; Engine Tractive Force, 70,000 lb.; Booster Tractive Force, 11,700 lb.; Total Tractive Force, 81,700 lb.; Total Weight, 443,000 lb.

the driving wheels are 70 in. instead of 63 in. in diameter.

With a slight increase in axle load these 2-8-4 locomotives have more heating surface and grate area than the 2-10-2 type. They are fully equipped with modern accessories, including large capacity tenders. These locomotives have extremely large size boilers, which act as power supply reservoirs in overcoming service fluctuations to the extent that steam failures are unknown. To

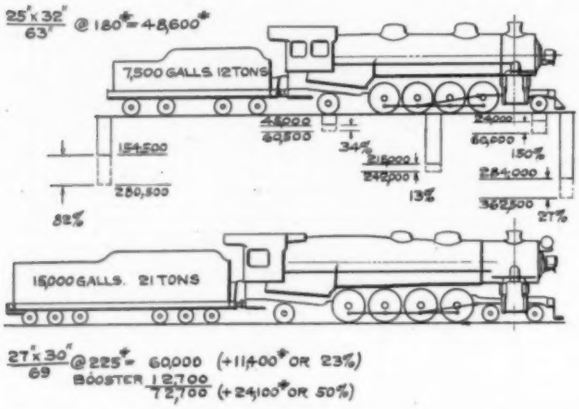


Fig. 6—Comparative Diagrams for a 2-8-2 Type Locomotive Built in 1913 and a 4-8-2 Type Built in 1927

those who have attempted to keep the gage pointer one or two pounds under popping, this may sound almost too good to be true. It is, however, made possible on this type by absorbing the extra weight of the large boiler on the four-wheel trailing truck.

Effect of Idle Time on the Road

We expect the locomotive to operate over long distances and under all conditions. Its operating cost must then be figured on the same basis and not on an ideal

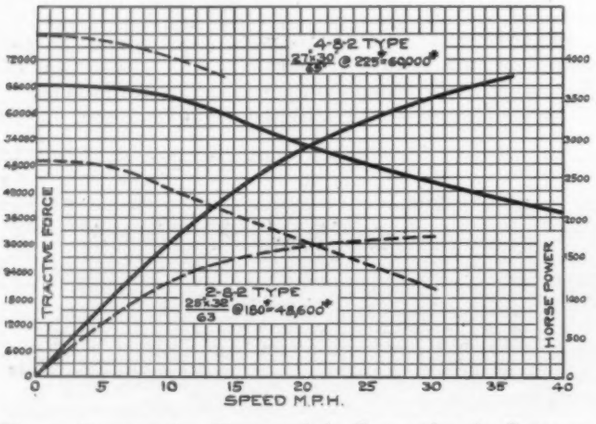


Fig. 7—Comparative Characteristic Curves for the Locomotives Shown in Fig. 6

performance, possible only for short test periods. It is not difficult to obtain low coal and water rates under fixed limits. It is quite another thing, however, to maintain these low rates in daily operation under the widely fluctuating loads and speeds met in actual service, for which reason conservative ratios in boiler and firebox design, as well as in steam distribution, often prove the most economical.

We see in Fig. 9 a train chart (time—distance) covering a typical freight train movement, selected at random, over a division a little more than 100 miles in length. The total lapse of time is shown by the upper line in which the offsets show the delays occurring at these particular points. It will be seen that seven hours total was required to make this run or an average speed of 15 m. p.h. over the entire division. The dotted line shows the actual running time of 4½ hr., or an average speed over the entire division of 25 m.p.h., or an increase of 66⅔ per cent over the elapsed time average.

It will be seen further that out of the running time one hour was taken up in drifting down grade so that the lower line shows the time during which the locomotive was actually working or, in other words, the time during which coal was being productively burned. Note that this time was 3½ hr. only or just one-half of the total elapsed time over the division.

Some delays are unavoidable in many instances and while the case shown is, perhaps, excessive, it is still representative of general freight movement today. As long as we operate under similar conditions to these shown, we must design conservatively and avoid possibilities of

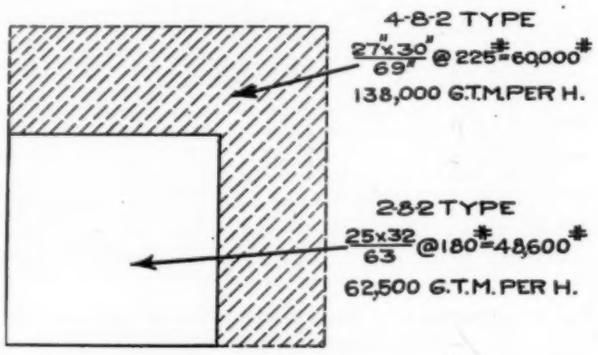


Fig. 8—Average Gross Ton Miles per Hour for 10 Trips Obtained by 4-8-2 and 2-8-2 Type Locomotives Operating Over the Same Division

undue standby losses. How much coal was burned during these 3½ non-productive hours?

Remember the operating cost is figured over the entire year and not over the test hill only.

We must, then, carefully analyze our operating conditions, proportion our locomotive to best meet these conditions and then decide as to what labor and fuel saving devices we can apply to advantage, bearing in mind that any change from normal design, as well as the addition of any accessories, means additional first cost and weight. To what extent then will these added costs and weights justify themselves at the end of the year, and to what extent might they have been better used in increasing the size of the boiler itself which still remains the controlling factor in the power output.

It is customary for the railroads at the present time to ask for, and to obtain, delivery on entirely new designs of locomotives beginning from 90 to 120 days after the receipt of the order. How many realize that the number of drawings required for a complete engine and tender design has increased from 353 (or 815 sq. ft.) in 1907 to about 1,109 (or 2,268 sq. ft.) in 1927 and that the number of patterns required has increased from 380 in 1907 to about 534 in 1927 (the above do not include drawings and patterns for dies, templates, etc., which number about 60 to 70 for each, nor does it include the

detail drawings for any of the accessories which are quite numerous in some cases).

Assuming an order of from 25 to 50 locomotives and an approximate cost of $100,000 each, which is not at all unusual at the present time, an idea is given as to

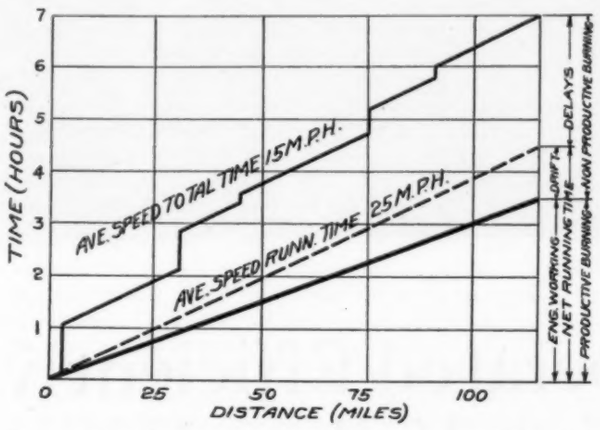


Fig. 9—Time-Distance Chart for a Typical Freight Train Movement

the size of the initial investment on which the railway company expects to make its return. In what other line of industry is an equal expenditure made with so short a time alloted for engineering development? I know of no better way in which the railroads of this country could express their confidence in the ability and co-operation of the locomotive builders.

Panama Canal Traffic in 1927

THE tonnage of vessels, and the volume of cargo passing through the Panama Canal for the year ended June 30, 1927, exceeded those in any preceding year, according to the annual report of the governor of the Canal; though the receipts for tolls ($24,228,830) were about one day's collections less than the record figure of $24,290,963 in the fiscal year 1924.

The number of commercial ships transiting the canal averaged 15 per day. Nitrate shipments from the west coast of South America declined more than 700,000 tons as compared with the fiscal year 1926. Nitrate and coal were the only important commodities in which shipments declined appreciably.

Mineral oil shipments, mostly from California, made up slightly more than one-fourth of the total cargo passing through the canal.

The record for each fiscal year since the canal was opened are shown in the table below:

Fiscal year ending June 30	Number of transits	Net tonnage	Tolls	Tons of cargo
1915[1]	1,075	3,792,572	$4,367,550	4,888,454
1916[2]	758	2,396,162	2,408,089	3,094,114
1917	1,803	5,798,557	5,627,463	7,058,563
1918	2,069	6,574,073	6,438,853	7,582,031
1919	2,024	6,124,990	6,172,828	6,916,621
1920	2,478	8,546,044	8,513,933	9,374,499
1921	2,892	11,415,876	11,276,889	11,599,214
1922	2,736	11,417,459	11,197,832	10,884,910
1923	3,967	18,605,786	17,508,414	19,567,875
1924	5,230	26,148,878	24,290,963	26,994,710
1925	4,673	22,855,151	21,400,523	23,958,836
1926	5,197	24,774,591	22,931,055	26,037,448
1927	5,475	26,227,815	24,228,830	27,748,215
Total	40,377	174,677,954	166,363,228	185,655,490

[1] Canal opened to traffic August 15, 1914.
[2] Canal closed to traffic approximately 7 months of fiscal year by slides.

For the fiscal year 1927 the net income from tolls and other miscellaneous receipts was $15,611,093, as compared with $15,151,668 in 1926.

The net profits on auxiliary business operations conducted directly by the Panama Canal, of which the most important are the mechanical shops, material storehouses, and fuel-oil plants, totaled $876,536, as compared with $841,310 in 1926; while those conducted by the Panama Railroad Co., exclusive of the steamship line but including commissaries, docks, coaling plants, and cattle industry, showed a profit of $1,644,189, as compared with $1,347,887 in 1926. The total net revenue of the year from all sources, exclusive of the Panama Railroad Steamship Line, was as below:

	1927	1926
Transit revenue	$15,611,093.80	$15,151,668.00
Panama Canal business operations	876,536.80	841,310.29
Total net revenue, Panama Canal	$16,487,630.60	$15,992,978.35
Panama Railroad business	1,644,189.37	1,347,887.33
Combined net revenue	$18,131,819.97	$17,340,865.68

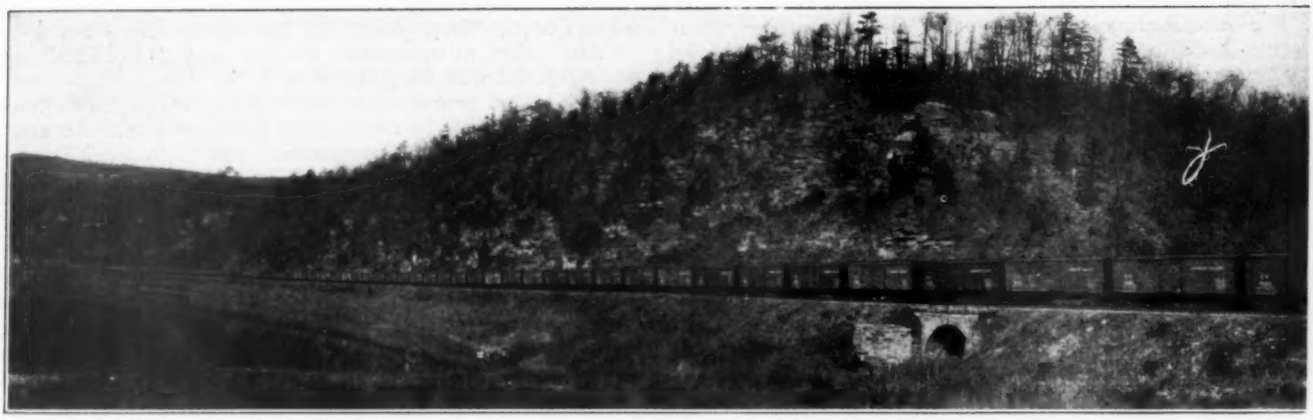
September, 1927

The tonnage of commercial vessels transiting the Panama Canal during the month of September, 1927, was greater than in any previous month; 2,532,942 as compared with 2,516,491 net tons in December, 1923.

The cargo tonnage passing from the Pacific to the Atlantic amounted to 1,802,804 tons, the largest amount in this direction since the opening of the canal. The cargo from the Atlantic to the Pacific in September, 1927, amounted to 594,949 tons, the lowest for any month since November, 1925, when 587,087 tons were carried.

Photo Rudolf Kreutzer

Monument at Cream Ridge, Missouri, to First National Railroad to Cross the State—the Hannibal & St. Joseph



One of the "Maintrackers" of the Lehigh Valley along the Susquehanna River

"Maintrackers" Operated Efficiently on the Lehigh Valley

Keeping trains moving through intermediate terminals results in a reduction in transportation expenses

SEVERAL years ago, the Lehigh Valley began to classify freight at Buffalo for movement through to destination. At first, this covered traffic for seaboard points only. At that time, the word "maintrackers" had not been coined, yet these few trains, at least, were "maintrackers" in the modern sense. From this modest beginning, the practice has been extended to include all classes of freight for various destinations.

The success of the method is indicated by the improvement shown in train operation factors during the five-year period from 1921 to 1926, in which interval the average miles per car per day increased 45 per cent, the gross tons per train and the net tons per train increased 9 and 5 per cent respectively, and train-miles per train-hour increased 3 per cent. During the same period, gross ton-miles per train-hour and net ton-miles per train-hour increased 11 and 8 per cent, respectively.

There are so many factors entering into train and yard operation that it is practically impossible to allocate the exact percentage of advantage or disadvantage resulting from any particular factor. However, it is certain in the minds of the operating officers of this railway that the "maintracking" of freight trains has contributed greatly to the improvement in operation shown. It will be observed that the largest percentage of improvement, amounting to 45 per cent in five years, has been in the average miles per car per day. This was to be expected since one of the prime motives in establishing the "maintracker" system was to reduce the detention of cars, both to reduce per diem and to improve service for the shippers.

Difficult Problems Encountered

Like the other railways on which "maintrackers" have been installed, the Lehigh Valley encountered difficulties which made it necessary to work out solutions adaptable to local conditions. The Lehigh Valley operates a double-track main line between Buffalo, N. Y., and Jersey City, N. J., 448 miles, in addition to 916 miles of branch lines. Some of these branches are in the Buffalo and Jersey City terminal districts. For example, in the Buffalo district, two branches extend from junction points on the main line just east of Buffalo, through the Tonawanda industrial district and the city of Niagara Falls to Suspension Bridge, N. Y., and to the Tifft Terminal of the L. V., on Lake Erie, in Buffalo. There are also a number of short branches in the Jersey City terminal district, including a line to Perth Amboy, N. J.

There is a large branch line mileage in the lake region of central New York, serving a territory given over primarily to fruit growing and dairy farming. There are also a few short branches in the steel and cement manufacturing district of eastern Pennsylvania, but by far the largest branch line mileage is to be found in the anthracite coal region in the vicinity of Wilkes-Barre, Pa., on which an average of somewhat over a thousand cars of coal originate daily.

All Freight Trains Scheduled

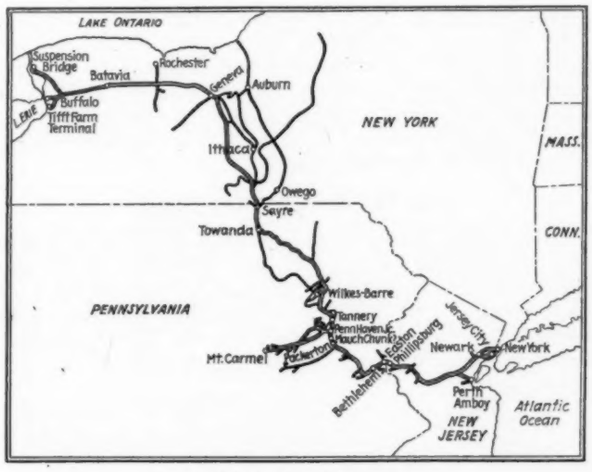
An important part in the "maintracker" plan was the scheduling of all freight trains. Since 1921, the Lehigh Valley has had a plan in effect whereby all freight is moved in scheduled trains. In other words, every car of freight handled, whether destined to a point 5 miles or 500 miles distant, has a definite time to move and a prescribed train in which to move. The freight train schedules are prepared with as much care as the passenger train schedules. Before they are published, a careful study is made of all conditions, such as the time of connecting trains of other roads, the time required for icing perishable commodities, the minimum time required for changing the engines and crews and every other conceivable detail.

In scheduling such freight trains, the first consideration was to meet the conditions and to provide the time of delivery demanded by the shippers and receivers and agreed to by other railways; for instance, third or fourth morning delivery from Chicago to New York. The next

consideration was to time the departure of these trains from the terminals so as to fit best into the terminal plan and the road conditions with respect to passenger train interference. In this way, the L. V. has eliminated the bunching of trains in and out of the yards and on the road and the inevitable detentions resulting therefrom, so that it has been possible to haul greater tonnage and get it over the road in less time.

General Features of the Classification

The freight in these scheduled freight trains is classified so as to permit the trains to run through the greatest number of intermediate yards without switching. Solid



The Lehigh Valley

trains for one destination are made up when the traffic flow will permit, otherwise the freight is grouped in accordance with its destination and so classified as to reduce the switching to a minimum in intermediate yards.

Eastbound freight is made up into solid trains at the Buffalo and Suspension Bridge terminals for Philadelphia, Port Richmond, Baltimore, New York and New England. Similar trains are also made up at Manchester, 92 miles east of Buffalo, where part of the traffic from Suspension Bridge and Buffalo is consolidated. Some of these trains run through as far as 460 miles, passing four intermediate terminals. Other trains, particularly those made up at Manchester, run 350 miles through three intermediate terminals.

Westbound traffic is handled in a similar manner. Solid trains are made up at Jersey City and at Bethlehem, Pa., for Buffalo, Rochester and western connections at Buffalo and Suspension Bridge. Two trains handling less than carload merchandise shipments from New York and Philadelphia are dispatched every night to Manchester transfer where this traffic is classified in accordance with destination and routing, consolidated and delivered to western connections on the second morning. This handling provides fourth morning service from New York and Philadelphia to Chicago, or the same service as is accorded carload traffic.

Anthracite coal from the Pennsylvania mining district is handled in the same manner. This coal is consolidated and classified for main line movement westbound at Coxton, Pa., and for eastbound movement at Packerton, Pa. Other branch line traffic, consisting exclusively of local freight, is handled to the main line without classification and then classified at the most suitable terminal on the main line. In the matter of train operation, however, freight is scheduled with regard to the connection on the main line, and the traffic originating at or destined to branch line points is moved on a definite and fixed schedule.

Prompt Handling Given Empties

Empty cars are also "maintracked" and the trains containing them are scheduled. This is important, in view of the fact that the loaded movement eastbound exceeds the loaded movement westbound in the ratio of 2 to 1. Special attention is given to empty refrigerator, tank and stock cars, which are dispatched in solid trains and run through the intermediate terminals. These trains are started from concentration points on schedules which set forth the running time from terminal to terminal. The run of each train is reported by wire on a prescribed form, any detentions being accounted for by each division to the final terminal.

Details of Classification

The specific classifications are contained in separate booklets for eastbound and westbound traffic. The first few pages of the booklet covering eastbound movement are devoted to general instructions, including a tabulation showing what commodities are to be considered as "symbol" freight. There is a specific rule providing that, in adding cars at intermediate terminals, the classifications must be maintained, and another that "symbol" cars cut out for repairs must be repaired with minimum delay and, when ready for movement, must be forwarded in "symbol" trains. Such cars cut out on the line, when ready for movement, must be taken to the next succeeding yard for forwarding in the first train of the proper character.

Since all freight trains are scheduled, the classifica-

tions are made not only according to destinations, but also according to trains, and the same train carries practically the same class of freight for the same destinations daily. The only variation to be found is in the limited number of cars permitted in the train for the purpose of filling out tonnage. The fluctuations in traffic are taken care of by running extra sections of the regularly scheduled trains, whenever the amount of traffic makes it expedient to do so.

Five regular through trains are run from Tifft Terminal, two of which go to Bethlehem, two to Oak Island, N. J., and one to Jersey City. Four regular trains operate from Suspension Bridge to Jersey City, two of which are automobile specials, handling principally automobiles and automobile parts for New York and New England. All less than carload merchandise is concentrated at Manchester, N. Y., where solid merchandise trains, properly classified, are made up for eastern destinations. Trains bringing this merchandise in from Tifft Terminal, Suspension Bridge and Buffalo proper are operated on such schedules that the freight may be transferred into solid cars, the proper classifications made and a solid train dispatched in a few hours. Two trains are operated daily from Manchester to Jersey City, containing this freight. The cement district in eastern Pennsylvania is served by two cement specials to Jersey City, one from Catasauqua, Pa., and one from Easton.

As an example of the scheduling and the classifications made, the data in the pamphlet covering train BP 4, from Tifft Terminal to Bethlehem, are as follows:

BP 4 Daily

Full Tonnage

Lv. Tifft Terminal	2:30 p. m.
Ar. Manchester	7:30 p. m.
Lv. Manchester	9:30 p. m.
Ar. Sayre	2:00 a. m.
Lv. Sayre	3:30 a. m.
Ar. Coxton	7:30 a. m.
Lv. Coxton	9:00 a. m.
Penn Haven Jct.	12:30 p. m.
Ar. Mahoning	1:30 p. m.
Lv. Mahoning	3:30 p. m.
Ar. Bethlehem	6:00 p. m.

From Tifft Terminal:

Train will handle perishable and other symbol freight received from connections up to 1 p. m., freight via Harlem river received after departure BJ-10, freight via Towanda S. & N. Y., and freight via Reading Company, East Penn Jct. and Bethlehem, filling out with other freight for Manchester and east.

From Manchester:

Train will handle all freight for S. & N. Y. via Towanda, merchandise from Manchester transfer for Towanda, Sayre freight house, Hazleton, Allentown, Easton and Perth Amboy, perishable from Coxton and via, perishable for M. & H. division, and perishable for M. & E. points. Also perishable and freight including merchandise from Manchester transfer routed Reading Company via East Penn Jct. and Bethlehem, filling out with other M. & E. freight.

When two or more sections are dispatched S. & N. Y. cars will be forwarded in the regular train.

Sayre:

Add freight of proper classification including S. & N. Y. via Towanda.

Towanda:

Set off cars for S. & N. Y. Pick up freight for East.

Coxton:

Add cars of proper classification.

Freight picked up at Towanda when continued in this train will be placed in proper classification.

Mahoning:

Add cars for Reading Company via Bethlehem and Reading Company via East Penn Junction.

Business routed Reading Company via East Penn Junction to be continued through in this train.

Perishable for Phillipsburg and via and merchandise for Easton may be cut out for forwarding in BP 2.

Classification

Reading Company via East Penn Junction (separated and blocked as between Perkiomen and East Penn Branches).

Reading Company via Bethlehem.

M. & E. perishable.

Other M. & E.

Coxton and via including M. & H.

Special Movement

A special schedule is provided for the movement of grain during the season when the commodity moves in trainloads, as follows:

Schedule 4

When grain is moving in trainload lots, it will be handled on this schedule.

Full Tonnage

Tifft Terminal to Manchester	4 hr. 30 min.
Manchester Yard	1 hr. 00 min.
Manchester to Sayre	4 hr. 30 min.
Sayre Yard	1 hr. 00 min.
Sayre to Coxton	4 hr. 00 min.
Coxton Yard	1 hr. 00 min.
Coxton to Penn Haven Junction	3 hr. 30 min.
Penn Haven Junction to Mahoning	1 hr. 00 min.
Mahoning Yard	1 hr. 00 min.
Mahoning to Oak Island	8 hr. 00 min.

This schedule also to be used as a basis for handling Baltimore and Port Richmond grain. Schedule to Mahoning to be maintained and prompt handling to be given from that point to the Reading Company.

Classification

Grain to be properly classified in accordance with destination or route. When dispatched in other than solid trains, grain must be together and blocked according to classification.

Trainloads of oil and gasoline are also handled under a special schedule. Unlike the grain, which moves through Tifft Terminal exclusively, these commodities are received at both Tifft Terminal and Suspension Bridge. Accordingly, they are brought to Manchester to be consolidated there into a through train, providing there is not a sufficient number of cars to run through trains from either of the terminals.

The Westbound Movement

All westbound freight is dispatched in "symbol" trains and the fluctuations in traffic are taken care of by operating either advance sections or second sections of these trains. The classification pamphlet for westbound freight also includes a schedule for the floats operating between New York and Brooklyn piers and stations and Jersey City.

Each westbound through train listed is accompanied by a list of its eastern connections, showing the origin of the freight and the time of its arrival at Jersey City. A list of the western connections is also given with the time of the departure of the trains from the Buffalo terminals and the time of arrival at the final destination.

There are only two classifications in the through trains, so far as freight for L. V. destinations is concerned, namely, Manchester Transfer and Manchester and West. Freight for points beyond Buffalo is, however, classified according to the line to which it is to be delivered, thus materially facilitating switching in the Buffalo terminal district.

A through train is operated daily from Jersey City to Suspension Bridge, particularly for business from the New England connections. A connection is made with this train at Manchester, which operates to Tifft Terminal with New England traffic routed through that gateway. In addition, through trains are operated daily from Jersey City to both Tifft Terminal and Suspension Bridge. A daily through train is also operated between Philadelphia and Manchester in connection with the Reading.

Daily trains of empty refrigerator, meat, stock and tank cars are operated from Jersey City, the number of such trains being governed by the empties available. The schedule and classification of these trains is as follows:

Schedule "S"—41' Daily
Full Tonnage

West Oak Island to Packerton	9 hrs. 00 min.
Packerton Yard	2 hrs. 00 min.
Packerton to Penn Haven Jct.	1 hr. 00 min.
Penn Haven Jct. to Coxton	5 hrs. 00 min.
Coxton Yard	5 hrs. 00 min.
Coxton to Sayre	5 hrs. 00 min.
Sayre Yard	2 hrs. 00 min.
Sayre to Manchester	5 hrs. 00 min.
Manchester Yard	2 hrs. 00 min.
Manchester to Tifft Terminal	5 hrs. 00 min.
Manchester to Suspension Bridge	6 hrs. 00 min.

Trains designated Schedule "S" consisting of empty refrigerator, meat, stock and tank cars will be dispatched from Jersey City once every 24 hours or oftener if sufficient cars are available. If there are not sufficient cars of this character for full trains every 24 hours, fill out of other empties will be used, the latter to be grouped and must be set out at succeeding yards to provide room for refrigerator, stock and tank cars, if necessary.

These trains will be classified at Coxton.

Packerton, Coxton and Sayre will be assembling points for Schedule "S" cars which must be added to Schedule "S" trains. If more refrigerators, stock and tank cars are on hand than can be taken care of in the Schedule "S" trains from Jersey City, such trains should be originated at these points and handled in the same manner as the trains from Jersey City.

Classification

From Jersey City—	From Coxton—
Packerton and via Coxton and West.	Wabash—Grand Trunk Other Susp. Bridge Tifft Terminal Buffalo Division Sayre and via.

A carefully worked out schedule of local trains is operated, supplementary to the through train service. These trains are run so as to make close connections with the through trains at the terminals of the locals, so that traffic originating at or destined to local points is given practically the same service as through business.

Each Car Traced

An important adjunct to the operation of "maintrackers" is a system of reports which supplies an accurate check on the yardmasters and insures proper classification. It has the additional advantage of enabling the railway to give the shippers prompt information as to car movement.

The run of all trains is followed closely by telephone and telegraph, both day and night, from the office of the superintendent of transportation. Records are maintained in detail of the character of freight in each train, the time consumed in each yard, the time used between terminals, the tonnage handled, etc. All delays must be accounted for in the same manner as passenger train delays and any errors in classification must also be explained.

An efficient system of tracing is conducted in conjunction with the method of classification for through movement and the scheduled handling of every car. Briefly stated, this system provides for a wire report to the superintendent of transportation of the consist of each train immediately upon its departure from the point of origin. This report is made on a special form and shows the car number, arranged in accordance with the last three digits for ready reference, contents, destination, route and consignee. Any change taking place in the consist of the train at intermediate terminals is also reported by wire or telephone as soon as it is made, with the result that the office of the superintendent of transportation has knowledge at all times of the location of cars on the railway. Shippers use this service extensively as it enables them to keep in close touch with their shipments. The information contained in this report, coupled with the scheduled handling, enables the railway to give the shippers and receivers definite information as to the time of arrival of their goods at destination or the time of delivery to the connecting lines.

Advantages of "Maintracking"

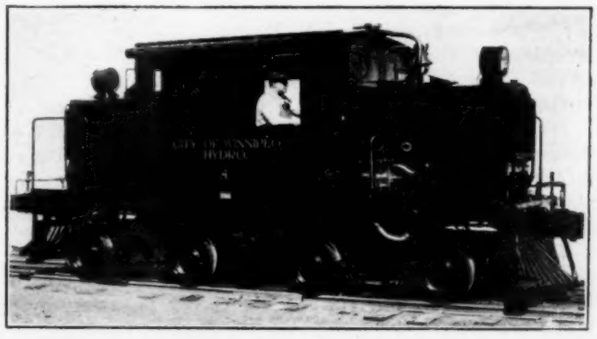
The adherence to strict classification rules and the scheduling of freight trains, as observed under actual practice on the L. V., has many advantages over the old method of dispatching trains "when tonnage is available" and without regard for classification. The latter system left entirely too much to the discretion of the yardmaster, permitting him to pass freight from his yard to the next one, merely to be rid of it. Inevitably, this results in congestion, side-tracking and delays.

Under the system which prescribes classification for movement through to destination, these conditions do not and cannot exist. The yardmaster has a definite plan laid down for him and he knows that the traffic must be properly switched, classified and dispatched at the time scheduled, as he is held in strict accountability.

In this way, it has been possible for the L. V. to handle its maximum business economically and efficiently without large capital expenditures for increased yard facilities. It has also made it possible to handle this maximum business with a minimum of yard expense and has aided materially in reducing road overtime.

The Human Element

The gradual growth of the system from the early experimental efforts has resulted in having all concerned thoroughly familiar with all its angles. In the final analysis, the success or failure of a system of this kind depends largely upon the thorough understanding of it by the supervisory officers and the degree of co-operation they render in making it a success. All concerned on the Lehigh Valley have been given every opportunity to familiarize themselves with the system; they have been required to do so, in fact. In order to aid them in grasping the situation as a whole, rather than knowing only the local conditions as they exist in their own particular districts or yards, all available trainmasters and yardmasters are taken on an annual special trip over the railway. This trip has the effect of familiarizing the men with the problems of the other divisions. It also enables them to think in terms of the whole railway instead of their own particular territory, which is vitally essential if any such system as this is to be a success.



20-Ton Gas-Electric Locomotive Built by Davenport Locomotive & Mfg. Corporation

For freight and passenger service on City of Winnipeg Hydro Electric's 25-mile line from Lac du Bonnet to a connection with the C. P. R.—Designed to maintain speed of 25 m. p. h. over difficult line at wide variations in temperature.

Frederick F. Fitzpatrick Dies Suddenly

President of American Locomotive Company since May, 1926, and chairman of the board of Railway Steel-Spring Company

FREDERICK F. FITZPATRICK, president of the American Locomotive Company and chairman of the board of the Railway Steel Spring Company, died suddenly at his home at Larchmont, N. Y., on November 16 from an acute attack of heart disease. Although he had suffered for several months from a chronic myocarditis, he had recently returned from a short vacation apparently in improved health.

Throughout his business career, Mr. Fitzpatrick had been an active figure in the steel industry, particularly in the manufacture of products used by the railroads. From its organization in 1902, he had been associated with the Railway Steel-Spring Company, serving in various capacities in the sales department of this organization until he became president of the company in 1910. Shortly after W. H. Woodin, president of the American Car & Foundry Company, succeeded to the presidency of the American Locomotive Company, plans were announced for the amalgamation of the Railway Steel-Spring Company with the American Locomotive Company. In carrying out the amalgamation early in 1926, Mr. Woodin was elected chairman of the board of the American Locomotive Company, and Mr. Fitzpatrick became its president, at the same time becoming chairman of the board of the Railway Steel-Spring Company.

Frederick F. Fitzpatrick

Mr. Fitzpatrick brought to his duties as the head of the enlarged locomotive company a wide sales experience in the railway field and a high degree of managerial ability, which was evidenced by the prosperous condition of the Railway Steel-Spring Co. during his presidency.

Mr. Fitzpatrick was born near Peterborough, Ontario, on June 9, 1866. He attended St. Joseph's Academy at Chillicothe, Mo., and started his career as a telegraph operator. After several years in various capacities in railroad service, during which he rose to the position of managerial assistant on the Missouri Pacific, he entered the supply field, being appointed St. Louis representative for the Scott Spring Company in 1898, which was mrged with the Railway Steel-Spring Company upon its organization in 1902. In 1905, three years after the formation of the present Railway Steel-Spring Company, he was made general sales agent, with headquarters at New York. He served in this capacity until he was elected vice-president in charge of sales in 1907. Three years later, in 1910, he was elected president and continued in charge of the affairs of this company until 1926. He then succeeded Mr. Woodin as president of the American Locomotive Company, after the Railway Steel-Spring Company had been amalgamated with the American Locomotive Company.

At the time of his death Mr. Fitzpatrick was also president of the Montreal Locomotive Works, the Canadian Steel Tire & Wheel Company, the American Locomotive Sales Corporation and the Richmond Locomotive Works, a subsidiary of the American Locomotive Company. He also held directorships in the American Brake Shoe & Foundry Company, the American Car & Foundry Company, the American Car & Foundry Securities Company, the Emigrant Industrial Savings Bank, the Safety Car Heating & Lighting Company, the Seaboard National Bank, the U. S. Life Insurance Company and the Superheater Company. He was active in the affairs of the Railway Business Association and was serving as a vice-president of that organization at the time of his death. Further, he was a member of the board of governors of the Railroad Club of New York which, on November 21, passed the following resolution:

"WHEREAS, Almighty God in His wisdom has seen fit to remove from our midst a fellow member, Frederick Francis Fitzpatrick; and

"WHEREAS, Mr. Fitzpatrick was not only a member of the Board of Governors and a past vice-president but through his activities was responsible in no small measure for the early growth of the Club, be it

"RESOLVED, that the Board of Governors of the Railroad Club of New York in meeting assembled this twenty-first day of November nineteen hundred twenty-seven, do hereby express our sincere regret at the sudden termination of the life of our esteemed associate; and we extend to Mrs. Fitzpatrick and the other surviving members of

his family our heartfelt sympathy in this their hour of sorrow."

Mr. Fitzpatrick is survived by Mrs. Fitzpatrick, two sons and a married daughter, in addition to two brothers.

Mr. Fitzpatrick was an outstanding figure in the railway supply field, few men therein being better known. His personality was attractive to the point of being lovable; and aside from his natural ability as a salesman, which formed the ground-work of his rise to enviable heights, his frank ways and ever-present sense of fairness won for him the respect of all with whom he came in contact.

With full appreciation of the fact that no executive can attain the maximum of success without the co-operation of his subordinates, Mr. Fitzpatrick was religious in seeing to it that those who served him well were properly rewarded; and the loss to those closely associated with him is, therefore, the more marked.

Younger Railroad Men's Conference

Improved handling of program characterizes fifth annual meeting at Jacksonville

THE fifth annual Younger Railroad Men's Conference, held under the direction of the Transportation Department of the Y. M. C. A., met at Jacksonville, Fla., November 11-13. There were 292 delegates in attendance, accompanied by 128 leaders and advisers, and a few speakers. The representatives came from 50 different railroad systems, 30 states, four Canadian provinces and Mexico. The conference officers were: President, Paul Smith, Pennsylvania Railroad, Pitcairn, Pa.; vice-presidents, George Endicott, Union Pacific, Council Bluffs, Iowa, and G. W. Hoke, Missouri-Kansas-Texas, Parsons, Kan.; secretaries, Louis Heard, Michigan Central, St. Thomas, Ont., and Theodore E. Daniels, Union Pacific, Omaha, Neb.

The conference opened on Friday morning, November 11, and closed on Sunday afternoon, the 13th. O. H. Page, superintendent of transportation of the Atlantic Coast Line at Jacksonville, was chairman of the local committee on arrangements; he made the opening address of welcome and was also toastmaster at the banquet on Saturday evening. George K. Roper, Jr., senior secretary of the Transportation Department of the Y. M. C. A., outlined the purposes of the conference.

The program of the convention was planned and put over by the young men themselves, the officers having held a two-day meeting in Chicago several months ago with various boys' experts and Y. M. C. A. Transportation Department advisers. One of the first things was to divide the delegates into groups of about 30, under expert leadership, to discuss on an open forum basis such questions as finding one's place in the world of work. present home relationships, future home relationships and the place of idealism or religion in life. The findings of these groups were eventually brought together and consolidated into a statement of the findings of the conference as a whole.

On Friday afternoon, at the same time that the discussion groups met, a large number of railroad officers who had consented to act as vocational counsellors, assembled to study their particular part in the program on Friday evening and Saturday morning. On Friday evening an address on "Finding Your Place In the World of Work" was made by C. C. Robinson, national Y. M. C. A. secretary for employed boys. Each of the young men was then furnished with a vocational blank. He was asked to check on this blank the kind of work he is now engaged in, what he would like to be 10 years from now, and why. These were then sorted into different classifications and on Saturday morning, after an address on "Present-Day Opportunities In the Transportation Department," by Roy V. Wright, managing editor of the *Railway Age*, a practical railroad officer met with each of the small groups of boys and spent the next hour or two advising with them as to their future and how they could best prepare themselves for the positions to which they aspire.

On Saturday afternoon the group were taken to St. Augustine and entertained by the Florida East Coast Railroad. At the banquet on Saturday evening, presided over by Superintendent O. H. Page of the Atlantic Coast Line, talks were given on "Glorifying the Job," by Hugh McMillin, machinist apprentice of the Canadian Pacific Railway, and on "Life—Grave and Gay," by Mike Grady, railroad poet and philosopher from the Pennsylvania Railroad at Canton, Ohio. The principal address, by H. N. Rodenbaugh, vice-president and general manager of the Florida East Coast Railway, was on "Railway Occupation as a Life Work," and was as follows:

Mr. Rodenbaugh's Address

"It is a fundamental requirement for a happy life that one must take pride in one's work. That essential feeling cannot be present unless one's work is such that it warrants a feeling of pride, not only because the worker has that opinion, but especially because those outside of its activities have a thorough and wholesome respect for it. There are few human activities that so fully meet these requirements as does railway work.

"The young man just starting out in life is, invariably, much perplexed as to what line of endeavor he shall devote his energy and his ambitions. He does not want to start in some work in which, after a few years of careful application, he will find that, while he has been learning something, and has made progress with its accompanying pecuniary reward, he has approached the end of that particular trade, or art, or other form of industry, and can not materially improve his condition in the succeeding years of his life. He has moved into a blind alley.

"If he is stronghearted enough to extricate himself, it is too often true that when he attempts to start in a less restricted work, he is too old to learn, successfully, the requirements of the new field, or else has his spirit weakened by seeing much younger men performing as well as he is, and giving promise of excelling him, by reason of their greater youth and their unbroken confidence. Or else, he fears he may engage in a form of work in which the need is spasmodic and irregular, with many gaps in the period of employment, resulting in decreased earning power and, what is worse, by far, an attitude of doubt and uncertainty which, all too effectively destroys confidence and ambition. It is a most pitiable condition when one realizes that the best years of his life have been devoted to perfecting himself in a

class of work which has a limited or an uncertain future.

"The young man who enters railway work need have no such doubts or fears. From the day he undertakes employment there, no matter how lowly the position, he has started on a road which leads steadily upward. Barring abnormal factors, the duration of his service, and the rate and limit of his progress are largely matters within his own control. His ability, energy, courage, and common sense are of primary importance here, as they are in every phase of human activity.

"I do not mean to say that it will be an easy conquest, for such it will not be. Patience will be needed to overcome many an obstacle, courage to continue the struggle in the face of almost overwhelming opposition, and, finally, the will and the disposition to take many a hard knock, many a bitter disappointment without flinching and without despair.

"A famous president of a large railroad system was once asked why railroad occupation proved so irresistibly alluring to those who had spent some time in it. He replied that he thought it was because no matter how able one was, nor how energetic, nor how long one lived, the railway worker could never feel that he had mastered all there was to know about any railroad. I think that explanation is accurate and comprehensive. The further one rises on the railroad ladder, the greater appear the things that he should study and investigate, if he is to acquit himself honorably of his task.

"A complete knowledge of the many and complicated divisions of railway work has never been obtained by any one; in fact, it is impossible of attainment, with the inherent limitations of the human being. But the field is so broad, and the exploring of it so fascinating, that no one who has ever entered it ever stops to think of human limitations, but applies himself with undiminished vigor to the solution of the multitude of problems which it offers. There is a speculative aspect to it that appeals to the normal man. He knows he is confronted with something that gives him short odds, but he is anxious to try his skill with it, hoping always that he will surpass the mark reached by his predecessors.

"Work in the railway field is a world in itself, so comprehensive is its scope. There is hardly any mental leaning or any physical training that cannot find a place for its utilization in the vast arena of railway operations. The one who dares can become a successful and a progressive leader; the one who plans can apply his thoughts in a concrete and appropriate fashion, and watch his dreams crystallize into new methods for promoting efficiency and improving service; the craftsman can apply the knowledge of his trade to the broadly diversified requirements of railway equipment; the clerk and the manual worker, the scientist and the theorist can all find a market for their wares.

"I have spoken of employment in railway work as being a road that leads steadily upward. I do not know of any field of occupation that offers so much promise of an increasing improvement in one's position. I do not mean to suggest that there are unlimited possibilities to the heights that one may reach. Everyone knows that there are, and that the supreme heights are only attained by the few who have combined with their own native ability, careful training and unbounded energy, the smiles of a gracious good fortune. But if one works loyally and devotedly, endeavors to perfect one's self in his assigned work, and accepts responsibility with courage and determination, and never stops studying the possibilities for improvement in his work, then, I say, he has greater chances for making progress through life than in almost any other form of occupation.

"There is no royal road to success in the railway field. No condition of birth, nor of education, nor of environment provides a clearly marked path to the much desired heights. The obscurely born and those with the proverbial silver spoon strive for the goal. The noted ones in this field of brilliant leaders have been recruited from among the graduates of our most famous colleges, as well as from those whom a harsh fate had kept from acquiring more than the "Three R's" in their brief school life. The nerve-racking, relentless city has furnished many who have reached the heights; the steady, substantial, and placid country-side just as many more.

"The railway worker can always feel that he is engaged with an industry whose existence is so vital to our present-day civilization that it could not survive but for a few days if the railways' operations were to cease. So smooth and so reliable is the railways' service now that its effect upon one's everyday life is rarely considered. Yet let some unexpected force precipitate itself into the railways' operations, and it is amazing to note how quickly every one of us is inconvenienced. To be a wheel in the huge and complex machine upon which our daily life depends must be a source of satisfaction.

"I have tried to show how broad, and open, and unbiased is the railroad field in which you are now engaged. The material rewards one will receive will depend upon many agencies, most of which are subject to the individual's control. Some few are not, but they are certainly no more numerous than can be found in any other division of activity. In fact, I think, they are less so. Regrettable as these exceptions are, the fact remains that railroad occupation should be a source of pride to every worker engaged in it, because of its inherent attractions, as well as being a substantial factor in climbing the rough trail to more material success. It is an occupation, above all, honored, honorable, and always worthy of our utmost efforts."

Election of Officers

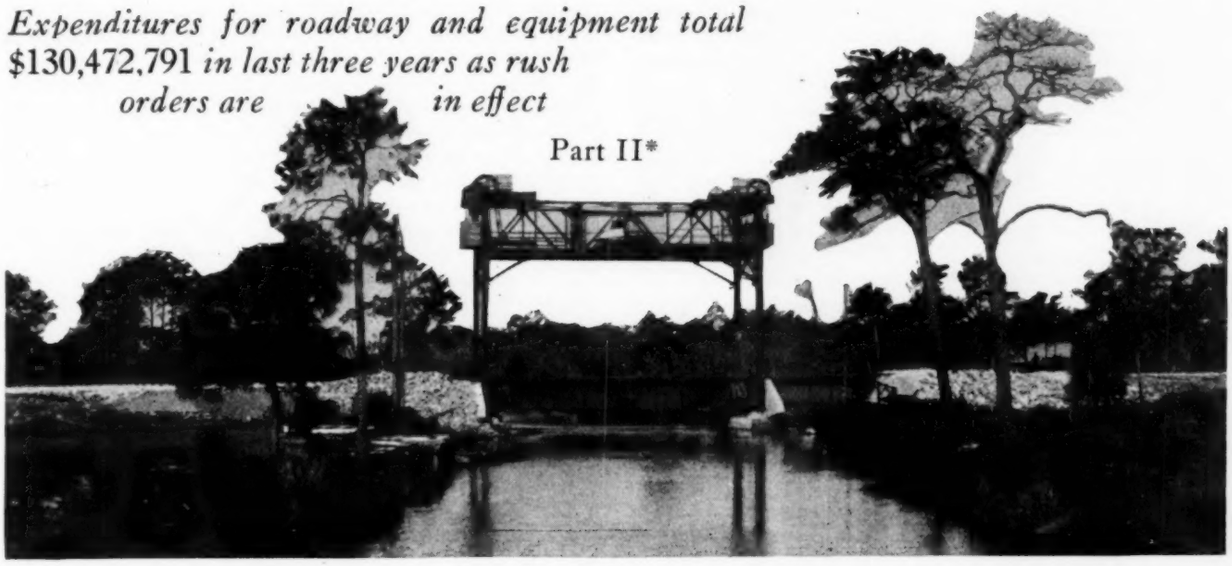
During the breakfast hour on Sunday morning, W. F. Hamrick, a clerk on the Chesapeake & Ohio, told of the accomplishments of the Younger Railroad Men's Club at Richmond. The time between breakfast and the church services was utilized by the various discussion groups. During dinner hour on Sunday the election of officers took place. There was considerable rivalry between the different groups and a number of young men were placed in nomination, largely upon the basis of the work that they had done in their various local clubs and organizations. The nomination addresses were limited to one minute and before the election took place all of the nominees gathered on the platform and each was given a minute in which to make any statement that he saw fit. Each delegate was then asked to vote for four men and the nine receiving the highest number of votes were designated as the new officers. They are as follows: President, L. L. Lee, machinist apprentice, Louisville & Nashville, Decatur, Ala.; vice-presidents, H. C. Leftwich, machinist apprentice, Chesapeake & Ohio, Clifton Forge, Va., and E. J. Quinn, pattern maker, Illinois Central, Chicago; secretaries, Arthur F. Haight, apprentice, Union Pacific, Portland, Ore., and C. J. Lundin, machinist apprentice, Pittsburgh & Lak Erie, Pittsburgh, Pa. Members of the advisory committee: W. G. Gray, special apprentice, Lehigh Valley, Lehigh, Pa.; R. F. Paulk, clerk, Atlantic Coast Line, Waycross, Ga.; William S. Hubbard, electrical apprentice, Norfolk & Western, Crewe, Va.; and Otto Krueger, electrician, New York Central, Buffalo, N. Y.

The closing session on Sunday afternoon included a report of the findings committee, the introduction of the new officers, and an address by Ivan V. Rhodes, executive secretary, Field Service Section, National Council, Y. M. C. A. on "Honoring a Great Leader."

Florida Roads Spent Millions in Construction During Boom

Expenditures for roadway and equipment total $130,472,791 *in last three years as rush orders are in effect*

Part II*



Lift Bridge Over Imperial River on Atlantic Coast Line at Bonita Springs, Fla.

ONE of the outstanding features of the rapid development which has taken place in Florida during the last few years, and particularly during the boom period of 1925 and 1926, has been the large construction programs undertaken by the railroads and the speed and effectiveness with which they have been carried out under the severe handicaps encountered. Breaking upon them with full force and with such rapidity, the boom in Florida found the railroads unprepared in common with other utilities and with business in general, necessitating unusually extensive additions and improvements.

On first thought this would make it appear that the roads had been dilatory and not alive to the developments taking place about them, but this was not the case. For years prior to 1920, the railways had been setting the pace in Florida, advertising its cities and recreational facilities; broadcasting its possibilities for the home-seeker, the fruit grower, and for industry in general; and at the same time attempting to build up and develop their own facilities in harmony with the progressive policy which they had been advocating. In spite of this, during 1920 and 1921, the transportation facilities of the roads serving Florida were insufficient to meet the demands made upon them, due primarily to the poor physical condition of the roads when returned to private operation. It became apparent at once that in order to meet the steady growth of the state, it would be necessary to increase the capacity of existing lines, not only within Florida itself, but also those lines connecting Florida with the great centers outside of the state. Accordingly, and about at this time, the Atlantic Coast Line, the Florida East Coast and the Seaboard Air line mapped out aggressive construction programs, each of which was planned to extend over a period of five or six years, and yet so designed as to meet adequately the increasing demands anticipated during that period.

Contrary to all reasonable predictions at the time, however, developments within Florida took place during 1922 and 1923 at such an unexpected pace that it was deemed advisable to move forward and to expand the construction programs which had been tentatively laid out. Accordingly, much work was put under way immediately with the result that during 1923, the improvement program of the Florida roads exceeded by over $4,000,000 the $3,000,000 program completed in 1922. In 1924 addition and betterment expenditures for roadway and new lines jumped to over $12,500,000, then to approximately $28,000,000 in 1925, and finally to approximately $43,300,000 in 1926.

Seaboard Passenger Station at Fort Myers, Fla.

During these later years, orderly and carefully planned programs of necessity gave way to hurried plans and rush construction methods as additional facilities became imperative. Every available resource was thrown into the work, and in spite of the unprecedented difficulties encountered through the severe congestion of traffic and the shortage of labor and materials, the Florida roads

*The first article on this subject appeared in the *Railway Age* of November 19, page 977.

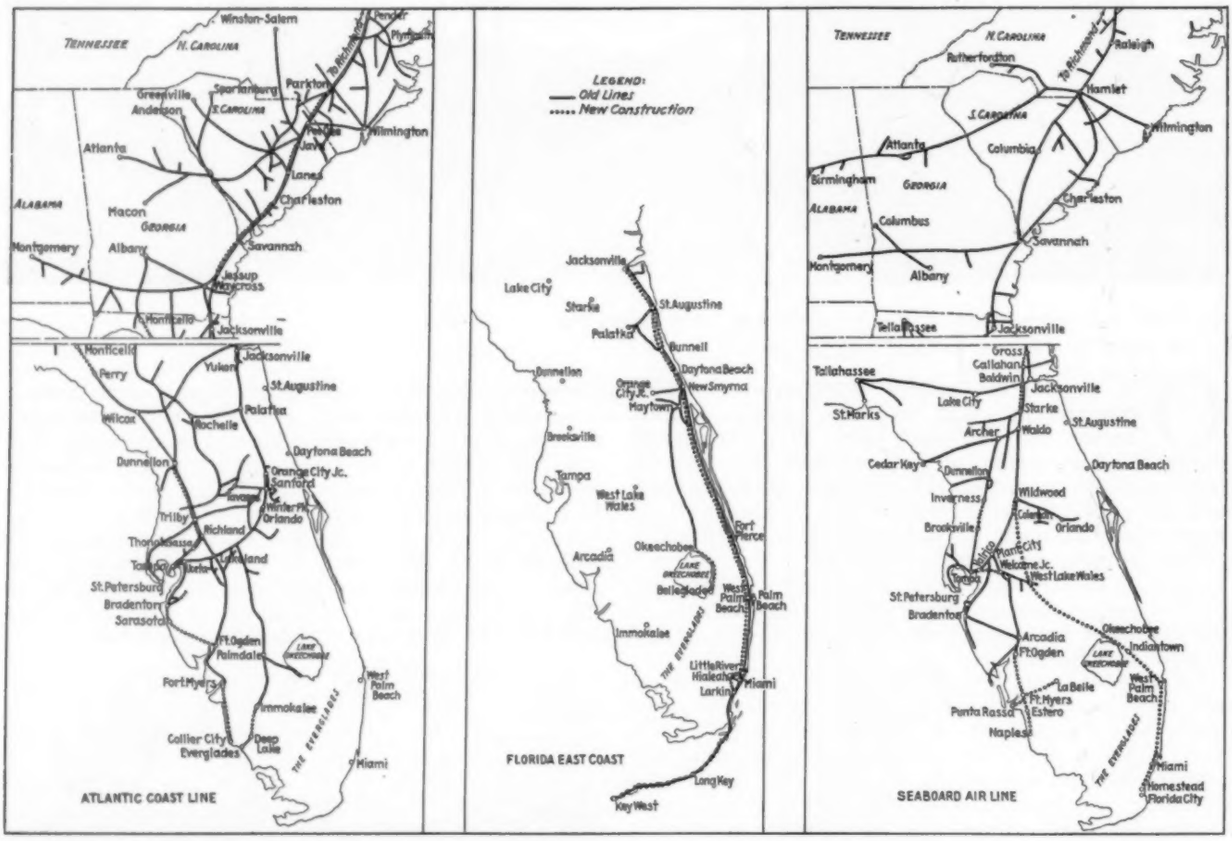
pushed their work at a remarkable rate, opening one unit after another to meet the traffic burden which, with increasing force, was being placed upon them.

Track Program of the A. C. L.

Practically the first important step taken by the Atlantic Coast Line toward improving its Florida service was its plan of 1922, contemplating completion of second-track construction between Richmond, Va., and Jacksonville, Fla., to afford a better outlet for Florida products. During that year, 45.31 miles of second-track was put under construction, and in addition, other second-track between Richmond and Jacksonville, and a little in Florida, was authorized to the extent of 205.34 miles, this work to be completed finally by the fall of 1927. With traffic increasing rapidly, it was soon found advisable to rush this work, which resulted in the completion of the state, to facilitate the heavy movement of celery and other perishables out of Sanford; a short section of almost four miles just north of Tampa to relieve congestion at that important point; and a portion of the 60-mile stretch between Dunnellon and Richland on the west coast line, now completed, to assist in handling the heavy volume of perishable traffic in connection with the opening of the new Perry-Monticello cut-off.

Of the new lines constructed by the A. C. L. in Florida during the last few years, probably the most important is the Perry-Monticello cut-off, which was completed in August, 1926. This line extends for about 40 miles between Perry and Monticello, and opens up a new gateway to the west coast of Florida, shortening materially the distance between this section of the state and the middle west.

Other important lines built by this road include that



Maps of the Three Roads Serving Florida Showing Old Lines and the New Track Construction During Last Few Years

of 54.79 miles in 1923, 68.11 miles in 1924, and 131.89 miles in 1925, which gave it a double track line for the entire distance from Jacksonville, Fla., to its northern terminus at Richmond, Va. Following further authorizations, the Atlantic Coast Line completed 74.82 miles of second track in 1926, all except 0.15 miles being in Florida, and at the end of the year had 11.44 additional miles still under construction, which has since been completed and placed in service.

From 1924 to the end of 1926, 74.7 miles of new second-track had been constructed by the Atlantic Coast Line within the state of Florida, practically all of this being completed in 1926. This work consisted principally of a nine-mile section just south of Jacksonville, the gateway to the north; a 10-mile section between Sanford and Orange City Junction, in the north central part from Thonotosassa to Richland, 16.5 miles, completed early in 1927, giving a new short route to Tampa; the new lines of the Tampa Southern from Bradenton to Sarasota, 12 miles, completed in July, 1924, and from Sarasota to a point near Fort Ogden, 40.8 miles, completed this year; and the new line of the Fort Myers Southern recently completed between Fort Myers and Collier City, about 50 miles. Another quite important extension being made at the present time is a line about 27 miles long between Immokalee and Deep Lake, at which point it will connect with an existing line and thus afford through rail transportation to Everglades.

F. E. C. Built 511 Miles of Tracks in Three Years

On the Florida East Coast, with its single-track line wholly within the state, and serving the entire east coast

from Jacksonville through Miami to Key West, the need for additional facilities was felt almost concurrently with the first large increases in traffic in 1922 and 1923. Until 1923, however, this road, following a normal program of improvements, had little difficulty in handling its business, but in that year, in anticipation of further increases in traffic, it mapped out a progressive program of construction which it anticipated would handle adequately any traffic situation which might be expected to arise. In the main, this program comprehended 325 miles of double-tracking on its 346-mile line from Jacksonville to Miami; the construction of 46.3 miles on the south end of its Okeechobee-Miami extension, from Okeechobee City to Belle Glade, and the encircling of Miami with a belt line 18 miles long. Compact as this program may appear, it is interesting to note that in the aggregate it involved approximately 4,510,000 cu. yd. of grading, the laying and surfacing of 511 miles of tracks, and the installation of approximately three miles of culverts and three miles of permanent trestles.

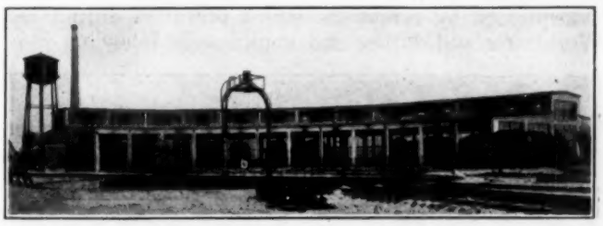
Following out its program, 37 miles of second main track was authorized immediately, and by the end of 1924, 23.4 miles of this unit was completed and in service. In the fall of that year, additional trackage totaling 202 miles was outlined for 1925, and later, another 118-mile section of second-track was scheduled for completion by the end of 1926.

In carrying out this work, construction was begun on

New Attractive Freight House Built by Florida East Coast at Daytona Beach, Fla.

the south end of the line in December, 1924, on the central portion in March, 1925, and on the north end in July, 1925. Speeding construction to the utmost under almost insurmountable difficulties of traffic, labor shortage, lack of borrow and construction materials, etc., the first section of track in the 1925 program was rushed to completion by July 10, 1925, this being followed by the completion of additional units which were immediately pressed into service. During 1925 a total of 151.44 miles of second-track was constructed and put in service, while in 1926 114.05 miles of such track was completed, together with ample passing tracks of 110-car capacity.

In addition to this second-track work, the program on the F. E. C. included a double-track cut-off of 29.5 miles



The Engine House Built by the F. E. C. in Connection with Its New Terminal at Hialeah, Fla.

between St. Augustine and Bunnell, known as the Moultrie cut-off, and two other minor double-track cut-offs, each about 2.5 miles in length, at Eau Gallie and Cocoa. All of this work was also completed in 1925. The most important of these cut-offs was, of course, the one between St. Augustine and Bunnell which shortens by 19 miles the old main line with its long swing to the west through Palatka. The energy thrown into this piece of work, as well as the straight second-tracking on the Florida East Coast, is evidenced by the fact that nine months after the first clearing and grubbing was started on the Moultrie cut-off, both tracks were in service.

The principal extension built by this road during the heavy traffic period of 1924 and 1925, was 46.3 miles of line between Okeechobee City and Belle Glade, on its so-called Okeechobee-Miami extension. This line is designed ultimately to provide a third track between New Smyrna on the main line at the north, and Miami on the south, and also to develop the rich Everglades lands along the southeastern shore of Lake Okeechobee. The other large and important piece of track work carried out by the Florida East Coast was the belt line which was constructed around the north and west sides of Miami during 1925. This line extends westerly, as double-track, 7.4 miles, from Little River on the main line to Hialeah, thence southerly, 10.6 miles as single track, to the main line at Larkin, and is designed to provide increased serv-

Constructing the Fill for New Second Track on the F. E. C.

ice to the industries of Miami and to afford access to the new yard and engine terminal at Hialeah.

Seaboard Makes Large Additions to Florida Lines

Construction on the Seaboard during the last few years has consisted primarily of new lines rather than of double-tracking, it being the obvious aim of that road to expand its mileage in Florida in order to develop new territory and to improve its through routes.

Depressed by conditions which prevailed during the World war and during and immediately following fed-

Finishing-Up Work on the Moultrie Cut-Off. Much of This Work was Done by Moonlight

eral control of the railroads, the ambitious plans of the Seaboard for development in Florida were largely held up until 1924. In that year, urged by more favorable conditions and the growing traffic to Florida, the Seaboard struck out on a large program of construction. In almost one step it secured approval and constructed a new 204-mile line in Florida, extending from Coleman on the Jacksonville-Tampa main line across the state to West Palm Beach and including a connection with an existing line at West Lake Wales over which trains could be operated between Tampa and West Palm Beach. This new line, which was constructed under the name of the Florida, Western & Northern, was completed and put in operation in January, 1925, practically nine months after construction was started, opening up new territory for development, affording the Seaboard a short route across the state from Tampa to West Palm Beach, and at the same time giving it a through route between the northern states and southeastern Florida.

In connection with this line, the Seaboard constructed a 12-mile cut-off on its existing Tampa-West Lake Wales line, between Valrico and Welcome Junction, shortening the existing route by 12 miles and greatly improving the service between the east and west coasts, particularly since it has made it possible to route trains other than through the busy territory in the vicinity of Plant City. To facilitate the handling of its increasing business into and out of Florida, it also constructed a 13-mile cut-off from Gross to Callahan, Fla., just north of Jacksonville, a line which has proved of large importance since it permitted the Seaboard to route its perishable trains and through passenger trains serving the lower coast, outside of the busy Jacksonville terminal. This cut-off and the one at Valrico were both put in service during the fall of 1925.

Extending its program during that same year, the Seaboard organized the Seaboard-All Florida Railway, as a subsidiary company, for the purpose of extending its lines approximately 200 miles on both the east and west coasts. On the east coast the major construction was a line from West Palm Beach south to Miami and thence to Homestead, approximately 100 miles, giving the Seaboard a through line of 1,067 miles, from its northern terminus at Richmond, Va., to the lower east coast of Florida. On the west coast the Seaboard's new lines extended from Fort Ogden on its leased subsidiary, the Charlotte Harbor & Northern, southward to Fort Myers and Naples on the Gulf of Mexico, approximately 64 miles; from a connection near Fort Myers on the Fort Ogden-Fort Myers line, easterly approximately 33 miles to La Belle; and from a point on the Fort Myers-Naples line, westerly approximately 11 miles to Punta Rassa. Work on these lines was started in January, 1926, and completed during the following fall and spring. These extensions make up a total of 108 miles constructed by the Seaboard on the lower west coast, which have added large productive areas to the Seaboard's territory.

Another step in the development of the Seabord lines was the organization of the Brooksville and Inverness railway for the purpose of constructing approximately 19 miles of line to connect the lines of the Tampa Northern, a subsidiary of the Seaboard, at Brooksville, with the company's Waldo-Archer-Inverness line near Inverness, Fla. This link, which was put in operation in December, 1925, opened up a substantial area of undeveloped territory, and, together with the lines of the Tampa Northern, provided a second main line for the Seaboard between Waldo on the main line to the north and Tampa on the south. This new through line, which was used immediately as a through freight line to the west coast, added greatly to the capacity of the Seaboard and assisted materially in relieving the serious traffic congestion prevailing in Florida during the late fall of 1925 and the spring of 1926. Combining all of its new line mileages, the Seaboard added 457 miles of new railway in Florida since January 1, 1925.

Double-tracking on the Seaboard in Florida during the last few years has been confined solely to those points

Laying Track on a Temporary Construction Trestle On the Perry-Monticello Connection of the Atlantic Coast Line

where congestion was the most severe. This work included principally 25.95 miles of second-track between Baldwin, and Starke, Fla., much of which was done in connection with extensive line and grade improvement work; approximately 5.46 miles of second-track between Wildwood and Coleman, just north of the junction of the lines to the east and west coasts; and 2.5 miles of second-track just north of Tampa on the Tampa-West Palm Beach Line. All of this second-track work was completed during 1926.

Bridge Work Was Also Extensive

New line and second-track construction was only a portion of the work carried out by the roads serving Florida during the rising tide of traffic since 1922. Yard tracks, sidings, and service tracks of all classes were extended, new yards and auxiliary tracks were con-

structed; engine terminals, passenger and freight stations were built and enlarged; extensive signal and interlocking installations were made; and hundreds of miles of roadbed were rebuilt and strengthened with new and heavier rail, stronger and more effective ballast, and with larger and stronger bridges and trestles to facilitate the handling of the flood of heavy traffic.

That the bridge work was extensive is readily appreciated from the amount of new line and second-track construction, where entirely new bridges had to be built and where single-track structures had to give way to those carrying two tracks. Each road had its share of this work, the Coast Line and the Seaboard standardizing in the main on plate girder bridges and ballasted-deck creosoted timber trestles where such were feasible, as did also the Florida East Coast, although this latter road found it necessary to contract a considerable number of steel and concrete structures. It constructed 17 of these latter types of bridges during the last three years, 14 of which carry two tracks and 3 one track. Seven of these structures built by the F. E. C. included draw bridges of various sizes and types. Twelve of the new bridges replaced timber trestles and obsolete draw bridges, while four were constructed along entirely new lines. Indicative of the proportion of this work is the fact that the twelve structures replaced had a total lengh of approximately 5,300 ft., while the new structures totaled about 4,300 ft.

Indicative of the amount of bridge work on the Seaboard is the trestle construction carried out by that road during 1925 and 1926. In the main this consisted of the conversion of 9,156 lin. ft. of open-deck trestle into ballasted-deck trestle; the driving and capping of piling for 9,676 lin. ft. additional trestle ready to receive a ballasted deck; and the filling of approximately 5,287 lin. ft. of open-deck trestle.

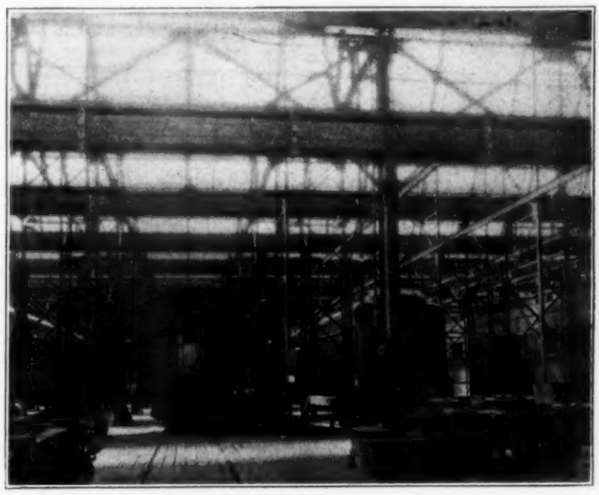
By far the largest single bridge project carried out in Florida during the last few years was that over the

Building the New Perry-Monticello Cut-Off of the Atlantic Coast Line

St. Johns river on the Florida East Coast at Jacksonville, which was authorized in 1923 and completed in the fall of 1925. This bridge, which is a double-track steel structure 2,451 ft. in total length, including a 216-ft. Strauss single-leaf heel-trunnion bascule span, and which cost in the neighborhood of $2,400,000, was one of the first projects undertaken by the East Coast in its effort to enlarge its gateway to the north and thereby increase the capacity of its lines. A complete description of this bridge and of the old single track bridge which it replaced appeared in the *Railway Age* of May 22, 1926.

New and Enlarged Terminal Facilities Form Large Part of Work

Yards, shops and engine terminals have also formed a large part of the construction programs of the Florida roads during the last few years, millions of dollars having been expended to improve these facilities. Some of the more important of these improvements on the A. C. L. included yard extensions at Waycross, Ga., and track extensions at Sanford and Lakeland, Fla., increasing the



Interior of Car Repair Shop at the New Miller Shops of the Florida East Coast

total car capacity at these points by approximately 860 cars; new shops at Montgomery, Ala., completed in 1924; and large yard facilities with a capacity for 1,370 cars, and a large modern locomotive repair shop at Tampa, Fla., completed during 1926.

On the Florida East Coast, yard, engine terminal and shop improvements were also extensive. At New Smyrna, the first division terminal south of Jacksonville, approximately 13.5 miles of yard tracks were constructed in 1924. At Bowden, near Jacksonville, complete new classification yards and an engine terminal were completed in 1926, these facilities, which included the laying of approximately 44.11 miles of tracks, being constructed to relieve the East Coast's old terminal facilities at South Jacksonville.

At Hialeah, new yard and terminal facilities were put under construction in May, 1925, and completed in November, 1926, these new facilities being in many respects similar to those provided at Bowden. At this point the work included the laying of 59.02 miles of new tracks, in addition to the 18-mile freight belt line previously referred to, extending around Miami on the north and west sides to give access to the new terminal layout. At Fort Pierce, additional tracks to the extent of 15.17 miles were also constructed, about half of this work being completed in 1925 and the remainder early in 1927.

Another large project carried out by the East Coast and completed in 1926, is its new system shops at St. Augustine, designed for the general overhauling and repair of locomotives, freight cars, coaches, and all other classes of machinery and equipment. These shops, which are known as the Miller shops, are unusual in many respects, even to the exterior of the buildings, which are attractively faced with a ¾-in. coat of buff-color cement stucco. Together, the shop buildings and terminal fa-

cilities at this point extend over an area of approximately 375,000 sq. ft. Nearly 15 miles of new tracks were laid in connection with this project. The magnitude of the yard, terminal and shop improvements made on the Florida East Coast during the last three years is evidenced by the fact that together they cost in the neighborhood of $5,300,000.

Work similar to that just outlined, carried out on the Seaboard Air line in Florida, included extensive facilities on the new Florida cross state line to provide for the heavy traffic encountered as soon as the line was opened; enlarged engine terminal, shop, icing and yard facilities at Baldwin; a new 700-car freight yard, a modern engine terminal, and water facilities at Wildwood; and a large

Grading for Second Track on the Atlantic Coast Line with "Station" Men

number of 100-car passing tracks along the Waldo-Archer-Inverness and the Tampa Northern lines so constructed as to become integral parts of a second track at a later date.

During the past year, a new engine terminal and modern shop facilities, together with a 500-car yard has been constructed at Indiantown, Fla., on the West Palm Beach-Miami line, near Lake Okeechobee, and at Dunnellon, the yard has been increased by about 200 cars. Considerable other work of this nature completed recently on the Seaboard includes the construction of small yards at Gulf Coast Junction and St. Petersburg.

Not only have the Florida roads been confronted with the necessity for additional trackage and terminal facilities, but they have seen the necessity for increasing the capacity of their tracks to the utmost, both within Florida and on their lines leading to it. To this end the Atlantic Coast Line, between January 1, 1922, and June 30, 1927, installed automatic block signals of the semaphore type on 98.35 miles of single track, and on 265 miles of double-track, practically all of which were designed to facilitate the handling of its Florida traffic.

In 1926, the Florida East Coast completed the installation of color-light automatic block signals throughout the entire 347 miles of its line from Jacksonville to Miami. This work, which was undertaken specifically to increase the capacity of its double-track line, was described in the July 31, 1926, issue of the *Railway Age*.

On the Seaboard rapid progress has also been made in the installation of automatic block signals, in fact this class of improvement work was one of the first steps taken by the Seaboard in the expansion of its system. The first installation of importance, which was of color-light signals, was on the Seaboard's 254-mile section of line from Richmond, Va. to Hamlet, N. C., a stretch of track which has always carried the densest traffic on the Seaboard. This installation, which was made in record time in 1925, together with the construction of 12 new passing tracks and the extension of 17 existing passing tracks, gave the Seaboard all of the facilities required for handling its heavy business north of Hamlet. A later installation of automatic color-light signals and additional passing tracks was made from Savannah, Ga. to Baldwin, Fla., via Jacksonville, a distance of 157 miles, which also gave the Seaboard a highly developed line through this territory. An article on the results being secured by the Seaboard through its extensive signal installations appeared in the July 16, 1927, issue of the *Railway Age*. Extending its program in Florida, the Seaboard is now undertaking the installation of color-light signals on the 88 miles of its line between Starke and Coleman, which, when completed, will give the Seaboard a total of about 500 miles of signal-equipped main line from Richmond, Va., to Coleman, Fla.

While all of the work outlined was being carried out in Florida, the roads found it necessary to build numerous passenger and freight stations, warehouses, section foremen's dwellings, tool houses and other auxiliary roadway buildings to meet the demand for larger and additional facilities, and in addition, the Florida East Coast in 1926 was forced to enlarge its general office building at St. Augustine at a cost of approximately $224,000.

Within the six years from 1921 to 1926 inclusive, the combined expenditures of the Atlantic Coast Line, the Florida East Coast and the Seaboard Air Line for new lines and for additions and betterments to roadway and structures have amounted to well over $100,000,000, this being in addition to a total expenditure of over $80,000,000 for additions and betterments to equipment within the same period of time.

Such have been the improvements in the transportation facilities of the three principal roads serving Florida in their strenuous effort to further develop, and at the same time to keep pace with the growth of the state. During the latter part of 1924 and through 1925 and 1926, when the boom was at its height, this effort became almost frantic at many points. Difficulties almost insurmountable delayed and interfered with construction on every hand. With traffic at unprecedented peaks, creating congestion throughout the state, construction equipment and work trains were delayed at every point; right-of-way and construction materials had to be purchased on short notice and at boom prices; plans were rushed in the making and in their execution; labor, in the face of the high scale of wages prevailing in the trades, was scarce and unreliable, resulting in a constant heavy turnover and in the necessity for importing large forces from outside the state; and in addition, certain sections of the various lines were seriously interfered with by heavy rains and floods.

The roads of Florida have demonstrated beyond doubt their faith in the continuance of the growth and prosperity of the state. Further evidence of this faith is in the fact that expansion and improvement work is still being carried on, slackened from the record-breaking pace of 1925 and 1926 to be sure, but nevertheless going on. It cannot reasonably be expected that the business of 1927 will surpass that of 1926 to the same degree that the business of 1925 and 1926 exceeded that of 1924. It is expected, however, that the business of 1927 will show an increase over 1924, and this expectation has been realized to date.

F. T. SINGLETON, chairman of the Public Service Commission of Indiana, has recommended that the state legislature enact a law at its next session which will require an attorney to represent the public at all rate cases brought before the Public Service Commission. With such a law it is felt that in cases of appeal from the ruling of the commission the attorney named to represent the public would automatically represent the public before the circuit court judges.

Depreciation Order Criticised

Accounting officers describe plan as theoretical, arbitrary, inconsistent and unworkable

WASHINGTON, D. C.

THE Interstate Commerce Commission's order requiring the railroads to set up a system of depreciation accounts for many classes of property, in addition to those now maintained for cars, was criticised as unworkable in its present form and based on too many theoretical considerations, requiring the introduction of too many speculative estimates into the accounting system, in testimony presented by accounting officers appearing on behalf of the Presidents' Conference Committee on Federal Valuation of the Railroads at the hearing before Commissioner Eastman on November 21 and 22.

The testimony on behalf of the committee followed four days which were devoted to statements made on behalf of the Southern Pacific relating to the depreciation order.

Southern Pacific Presentation

A temporary substitute for the depreciation accounting plan was proposed on behalf of the Southern Pacific by A. D. McDonald, vice-chairman of the executive committee and president of the Texas and Louisiana lines; and other accounting and engineering representatives of the company discussed various phases of the subject. Mr. McDonald referred to the order as "in its consequences, the most important and far-reaching decision ever issued by the commision." He expressed the opinion that Congress did not expect or require the commission to go to the extreme represented by Order 15100. He expressed the hope, however, that the commission would defer action on the whole depreciation question until fundamental questions as to the rate base are passed upon by the Supreme Court.

At the outset he said that the testimony of the Southern Pacific would deal with the case as an accounting case and not as a valuation case; that the position of the Southern Pacific with respect to depreciation for valuation purposes remains unchanged. He would assume that charges to operating expenses for maintenance should be on the basis of the actual cost of maintaining the property, that is, the replacement cost and not a proportionate part of the original cost. He thought it reasonable to assume that Congress did not have in mind the doing of anything that would lead to an increase in rates, but that this is precisely what might follow if the commission's rules are made effective, and if the commission adjusts rates so as to allow the railroads to earn a fair return. "The commission is apparently endeavoring to apply to the railroad business a set of depreciation accounting rules designed to fit the telephone business."

As to past accrued depreciation, Mr. McDonald questioned the commission's right and authority to take action. "It should be remembered that by-gone rate policies of the commission did not include depreciation allowances, and, of course, these rate policies cannot now be reopened or revised to conform to the present views of the present commission."

What Expenses Should Be Charged

Is it the replacement cost or the original cost that a railroad is entitled to charge to operating expenses, in determining the amount necessary to enable it to earn a fair return? Is not a carrier entitled, before coming at all to the question of profit or net return, to earn a sufficient amount to maintain its property in efficient operating condition, without being compelled to obtain funds for this purpose elsewhere?

When the replacement cost is less than the original cost, the public would be overcharged through charges to operating expenses, and where, in any year, the replacement cost is more than the original cost, the books of the carrier would show an overstatement of the actual net railway operating income.

The creation of depreciation or replacement reserves sufficient in amount to meet replacement costs is as practicable as any other method. As nearly as can be foreseen, the yearly accruals could be adjusted to meet changes in the general levels of prices. Under the replacement method of accounting, the cost of some items of property replaced, for example, rails, ties, etc., could be charged directly to operating expenses, while the replacement cost of other items could be charged to operating expenses piece-meal on an estimated basis over the estimated lives of the various kinds of property through the use of the depreciation or replacement reserves. This method of accounting would mean that all accounts would be dealt with on the same basis, and not on the mixed bases now in effect, or as proposed in Order 15100.

The Commission, in my judgment, erroneously accepts as a settled and established principle that the original cost, and not the replacement cost, of property, is the proper measure of the charge against traffic for the exhaustion of property. Traffic paid for in depreciated currency should be charged with the cost of the property consumed in operations on the same basis of values. When the value of money decreases, there is no basic reason why the increased cost of the new property over the cost of the original property consumed in operations should be added to the capital account, and thus burden the patrons or the public, in later years. Consideration of all of these matters inevitably leads one to the conclusion that, because of the present uncertainty and the existing circle of confusion in the minds of many as to the proper and correct method of accounting to adopt, the proposed depreciation accounting rules should not be made effective, pending determination by the Supreme Court, which appears necessary from the view of a majority of the commission, as expressed, for example, in the O'Fallon report, of the fundamental questions with respect to the rate-base and the deduction, if any, to be made for depreciation. The commission is not now in a position to decide definitely just how the accounts should be changed.

When should expenses and costs be charged against revenues? Theory must be applied in a practical way. Each month or year or other period of accounting should

stand alone, and the revenues and expenses properly applicable to the month, year, or period, should be so allocated as far as is practicable. In the case of revenues, this can be done only approximately, because it is impracticable to ascertain the precise location of either freight or passengers at midnight at the end of a month and then to compute and to divide such revenues as between months. In the case of expenses, as to many items, all that can be done is to make the best possible estimates. Take, for example, repair costs. Theoretically, such expenses might be spread over the period during which the part replaced was wearing out, but this would serve no useful purpose.

Extent to Which Depreciation Should Be Charged

If the commission decides to proceed at this time with its original cost theory, I recommend as a temporary substitute for the plan contained in Order 15100, the following rules:

1. Continue present rules for accounting for so-called depreciation of equipment, the designation of the ledger account to be "Reserve for Retirement of Equipment."

2. Subject to the exceptions and rules hereinafter stated, prescribe retirement accounting rules for property, included in the following accounts:

5—Tunnels and subways
6—Bridges, trestles, and culverts
7—Elevated structures
16—Station and office buildings
17—Roadway buildings
18—Water stations
19—Fuel stations
20—Shops and enginehouses
21—Grain elevators
22—Storage warehouses
23—Wharves and docks
24—Coal and ore wharves
25—Gas producing plants
29—Power plant buildings
30—Power substation buildings
35—Miscellaneous structures
37—Roadway machines
44—Shop machinery
45—Power plant machinery
46—Power substation apparatus

(a) For railroads having operating revenues over $100,000,000 annually, observe a minimum ledger value (estimated if not known) of $50,000 for a unit of property; other minimum amounts, to be fixed by the commission, for other classes of railroads.

(b) The designation of the ledger account to be "Reserve for Retirement of Road Property."

3. Consider other property and accounts to be non-depreciable for accounting purposes, as follows:

(*Accounts classified as depreciable accounts in Order* 15100)

4—Underground power tubes
8—Ties
9—Rails
10—Other track material
11—Ballast
13—Right-of-way fences
14—Snow and sand fences and snowsheds
15—Crossings and signs
26—Telegraph and telephone lines
27—Signals and interlockers
28—Power dams, canals and pipe lines
31—Power transmission systems
32—Power distribution systems
33—Power line poles and fixtures
34—Underground conduits
36—Paving

(*Accounts classified as non-depreciable accounts in Order* 15100)

1—Engineering
2—Land for transportation purposes
3—Grading
12—Track laying and surfacing
38—Roadway small tools
39—Assessments for public improvements
40—Rev. and Oper. Exp. during Construction
41—Cost of road purchased
42—Reconstruction of road purchased
43—Other expenditures—Road
47—Unapplied construction material and supplies
71—Organization expenses
72—General officers and clerks
73—Law
74—Stationery and printing
75—Taxes
76—Interest during construction
77—Other expenditures—General

4. In the case of any unusual structure, depreciation may, with the approval of the commission, be deferred until the retirement of the structure is definitely determined upon.

5. Provide a rule, for special conditions on a particular railroad, that property may be transferred to the other group of accounts.

6. Charge all repair costs to operating expenses as incurred except:

(a) Renewals occasioned by floods, fires, etc., may, with the approval of the commission, be charged to operating expenses over a number of months or years; and

(b) that in cases where the cost of the repairs or renewals made at any one time to a unit of road property, will constitute 75 per cent of the appraised value of the property as renewed, the property shall be considered as retired, and shall be accounted for on a retirement and replacement basis.

7. Credits to the account "Reserve for Retirement of Road Property" shall be made on the basis of percentages determined from studies of estimated service lives and salvage values of individual structures.

The plan above recommended aims to spread these charges evenly over the life of the property, thus avoiding heavy charges to operating expenses when property is retired from service. The plan corresponds in every respect in principle to the plan prescribed by the commission for equipment depreciation.

With regard to the retirements of property having a ledger value below $50,000, these retirements, in the case of the large railway systems, will fall fairly evenly year in and year out, and will not unduly burden operating expenses. I see no useful purpose to be served by requiring all railroads to make annual reports of neglected or deferred maintenance. The annual reports of the railroads to the commission contain information as to renewals of rails, ties, etc., also the amount of expenditures for maintenance, and the commission can, whenever desired, obtain from these data a rough approximation of the physical condition of any railroad. Such a study could, if necessary or desirable, be supplemented or extended by a physical examination of the particular road under investigation.

If a general depreciation accounting plan is to be adopted, the reserves will have to be accrued on the basis of either original costs or replacement costs. If the commission decides to proceed on the original cost theory, I think that it is unnecessary to segregate or to redistribute the account, "Investment in Road and Equipment" in the manner indicated in Order 15100. If the depreciation accounting plan is to apply to only a part of the Road and Equipment accounts, it would be practicable to estimate the necessary basic figures, and to keep them in memorandum or subsidiary record form for depreciation accounting purposes.

Cost of Complying With Order

I am advised by the heads of our accounting departments that the cost to install the necessary records and to get the work properly started would be about $470,000, and that the cost thereafter would amount to about $333,000 annually. Assuming these costs to be approximately correct, applying them on a mileage basis to all Class I railroads, the total cost to install would be $8,400,000, and the annual cost thereafter would be $6,000,000. Assuming, however, these figures to be only *one-half* as large, I should think the commission would want to determine the approximate cost to the railroads of complying with the order before it is made effective.

Order Would Increase Operating Expenses

If the commission proceeds to make effective the plan contained in Order 15100, modified in some such manner as I have suggested, operating expenses will be increased for the following reasons: (1) All railroads have expanded their properties at costs greatly in excess of the costs of 20 and 30 years ago; (2) The current debits and credits will be based on existing property, including the additions constructed in recent years at high prices; (3) The debits to the depreciation reserve

accounts for property retired, will be on account of the old property constructed years ago during the level of low prices.

Granting it to be true that the plan will result in decreasing net railway operating income, who is to provide the revenues represented by the balance in the depreciation reserve? Either the patrons must do so through increases in rates, or the owners must bear the burden.

This matter of depreciation is inseparably connected with the proper settlement of the so-called railway problem. . . . Unless fair and proper policies, legislation, and regulations, are adopted and made effective, the continuance of private ownership of railways will be impossible.

At the concluion of the Southern Pacific testimony, J. R. Bell, general attorney of the company, furnished to the commissioners a memorandum on the depreciation order by George O. May, of Price, Waterhouse & Co.

Mr. Ekin's Statement

The opening statement for the Presidents' Conference Committee on Federal Valuation of the Railroads was made by J. J. Ekin, comptroller of the Baltimore & Ohio, who said that provisions of the order, which has been suspended pending further hearing, is in some respects inconsistent and arbitrary and would work out inequitably. He also said he was not in favor of adding any more to the elements of "guess-work" included in railway accounts.

An abstract of Mr. Ekin's statement follows:

The first thing the commission requires is that the carriers shall submit a statement classifying the physical elements of property into the various investment accounts and, as to fixed property installed prior to June 30, 1914, shall use the quantities and prices determined by its Bureau of Valuation. Property installed since June 30, 1914, shall be stated in actual quantities and actual prices so far as possible. This at once brings us to the issue of valuation. It compels the carriers to take the quantities and prices as found by the commission's inventories and set up on the carriers' books the values so determined. . . If the sum of the depreciable property and equipment thus found by using the commission's records is substantially less than the aggregate amount of the carriers' investment no adjustment is to be made, but if in excess or equal to the amount shown on the carriers' books or if the difference produces a plainly inadequate quantity for the non-depreciable items including grading, then each of the primary depreciable accounts are to be scaled down or reduced. No ruling could be more arbitrary and less conducive to uniformity. The rule only works one way for the order permits no scaling upward. The order is inconsistent in that it proposes to write up the value of some property and write down the value of other property.

Having guessed at the investment and classified it by primary accounts and having made a more or less arbitrary assignment between depreciable and non-depreciable, we are now required by the order to guess the life of the various elements of property. This is put on a temporary basis, the commission recognizing fully the difficulties and the various indeterminate elements involved. The prospects of the future, everything of an uncertain nature, are brought in and the carriers required to submit a sworn statement as to the average prospective life of various elements composing the property. . . . Having separated the property between depreciable and non-depreciable; having attempted to find the rates or percentages of depreciation based on estimated service life; we find an abnormal, purely theoretical, factor injected into the plan "extraordinary repairs"—the unknown quantity, which may be termed "X." The procedure suggested in the order for this item is based upon the theory that as heavy repairs tend to lengthen the service life, a portion of such repairs should be spread over the service life through depreciation charges, instead of being charged when made to operating expenses. The result will be a "dead line" of charges to operating expenses through depreciation regardless of the actual work done and the expenses therefore for maintenance will have a distorted relation to the earnings. Consider a bridge that may have been put in service 20 years ago: Under the order the carrier is required to estimate in the future what it may do to that bridge, under conditions of the future which are not known, that will extend its life and in making this estimate the cost of the future so-called extraordinary repairs and the estimated additional life that will be put into the bridge must be considered and given weight in determining the rate of depreciation which will be applied, not only for past accrued depreciation but which will be applied in determining the current charges for the so-called depreciation accounting providing for equalization of the so-called extraordinary repairs.

[As to locomotives] in the light of development of American industry, particularly railroads, including the possibility of a greatly increased electrification of steam roads, it is not logical to attempt to fix a large part of expenses of maintenance of the future on the basis of past experience and without any regard to the volume of traffic in a given year.

This is purely a theoretical proposition; there is no need for it in railroad accounts. It sets up a twilight zone between repairs and retirements, which would result in endless argument and confusion and render accounts of the carriers subject to manipulation. This thing, which is nothing more or less than combining the amortization of investment loss with certain repairs and renewals, is not sound in principle, nor is it practicable of administration. Accounting doesn't concern itself with the far distant future. Operating expenses of the present should not be charged with repairs which may or may not be incurred in the far distant future. Those familiar with the practical aspects of maintenance will perceive the ease with which the accounting for so-called extraordinary repairs could be manipulated.

Past Accrued Depreciation

The proposed procedure under this feature might result in converting a profit and loss surplus into a deficit and there would be the danger of impairment of credit, This point is met by the simple expedient of changing the name of the account, which has no effect whatever, the fact being that the credit is impaired when this amount is set up on the balance sheet regardless of the name by which it may be called. The commission will permit the carrier to amortize this charge by annual charges to profit and loss, but there is no assurance whatever that the carriers will be permitted to have a rate base which will earn net income sufficient to carry to profit and loss an amount sufficient to meet these annual charges.

This indeed would be a hardship to the carriers, and with such balance sheets would render very difficult the

future financing of the carriers. It would be of peculiar disadvantage to those companies which have a large amount of leased mileage, the contracts covering such lease of property in many instances being directly affected by setting up past accrued depreciation on the lessee's books. Reduced to simple terms, the proposal contained in the order as to past accrued depreciation is (1) a reduction of surplus to take care of an assumed depreciation on property, and (2) making retroactive a system of accounting and penalizing the surplus of the carriers ascertained under a different system of accounting. If, any past accrued depreciation is to be placed upon the balance sheet representing a lessening in value it should be, in fact will have to be, the result of a physical examination of the property. . . .

Deferred Maintenance

The speaker here gave an example based on the records of the Baltimore & Ohio, from which it appears that the amount of depreciation required by the proposed rules would wipe out the total corporate surplus of the company, over 81 millions of dollars; and with the same basis the capital account of the Class I roads of the country as a whole, would have their profit and loss account shrunk to an alarming percentage. He then proceeded to make a searching analysis of the proposed rules for calculating deferred maintenance, which require a railroad officer to certify under oath to statements depending on assumptions and individual opinions, and call for an interminable list of estimates and equalization of expenditures over a period of years regardless of imperative financial obstacles; and require infinitesimal details which are utterly useless; and he closed with the statement of his "firm conviction that the accounting for maintenance and upkeep of the track structure should be charged currently to operating expenses as replacements are made, the management of the carriers making these expenditures from time to time to meet the requirements in the development of the art of transportation and to best meet the requirements in handling the traffic offered with its fluctuations from year to year, instead of having a dead line or average maintenance apportioned over estimated periods representing the cycle of service life of the various units. . . . The accounts of the carriers should be kept and stated to show as nearly as possible the actual transactions."

Statement by F. W. Charske

Mr. Ekin was followed by F. W. Charske, vice-president and comptroller of the Union Pacific System, who said:

"The cost to the railroads of instituting this plan would be great, and the cost of administering it would greatly exceed the cost under the existing accounting plan. In my opinion, this would not be compensated for by any benefit to any one. But, on the contrary, the results would be harmful. The accounts would not show the facts, would be based largely upon guesses, and would be false and misleading."

Mr. Charske discussed some of the same features covered in Mr. Ekin's statement. He also said, in part:

The cost of maintaining the railroad should be charged to operating expenses and, in the case of retirement and replacement of a unit, the cost of replacing in kind the unit retired, less salvage, should be charged to expenses, as is provided in connection with the replacement of parts of units. The replacement of units is merely repairs given to the *railroad,* just as the replacement of parts of a unit is repairs to the unit. The order revolutionizes the long established conception of *units* by designating *parts* of the track structure as units and by designating also *parts* of so-called continuous structures as units. With or without depreciation accounting for fixed properties, there is no more justification for treating these parts as units than there would be for treating as units the parts of other items of property which are themselves defined as units in the classifications; for instance, a locomotive, a car, or a building.

Extraordinary Repairs

For a railroad made up of millions of various kinds of units and parts, of varying costs and of varying indeterminable lives, many of which are retired not because they are worn out but because of obsolescence, inadequacy, or public requirements, it is impossible to determine even with a fair degree of accuracy the life of individual units or parts, or the average life of a group of units or parts represented by a primary investment account. Service life is not the only thing to be estimated. The rates first prescribed would be mere guesses and any attempted revision of the rates would be also mere guesses. Maintenance work is done as necessary and usually when it can be done most economically and the cost of doing the work should be charged to operating expenses when the work is done. Any accounting plan designed to show, as this plan is, approximately the same charge for a large part of maintenance from month to month and from year to year, regardless of the actual maintenance work done and the expenditures therefor, is wrong in principle, would not state the facts, and would be misleading. There is no more need or justification for this than there would be to equalize the charges to other expense accounts. On most railroads the variation in total expenditures for maintenance from year to year is not out of proportion. Some railroads, which must depend upon their current earnings to pay operating expenses, curtail expenses during periods of depression in greater degree than others do. No plan of accounting will change this. Maintenance work cannot be done without money to pay for it. The accounts should show the facts; that is, that expenditures for maintenance or other purposes have been decreased or increased as compared with previous periods. Under the existing regulations they do show this. Under the plan prescribed in the order they would not. This is recognized by the provision that charges for retirements and extraordinary repairs shall not be made direct to the depreciation reserve but *for convenience in comparison and analysis shall be charged to the primary accounts in maintenance expense, corresponding amounts to be released from the reserve and credited to a special credit account to be provided under maintenance expense.* Even this would not afford comparison with previous years by primary accounts because the charges would not be on the same basis. The total of the maintenance account (the figures usually published) would not be at all comparable. It follows that the plan would not promote efficiency and economy in maintenance work and stabilize labor forces or protect investors and the public, as statements in the order intimate it would. It would be uneconomical to apportion maintenance *work* equally over the twelve months of a year or over a period of years, even if it could be done.

Much is said in the order about the burden upon

patrons and the amounts that patrons are called upon to pay each year as operating expenses. Judging from past experience, it seems unlikely that any plan of accounting would result in a burden being placed upon patrons. Under the existing accounting regulations, net railway operating income has not represented a fair return upon the value of the properties as found by the commission. . . . Patrons do not pay any amount as expenses, each shipper or passenger paying only a rate for the tranportation service accorded him. Rates are not usually increased in prosperous years and therefore patrons are not burdened by the increase in maintenance expenses or other expenses in such years. Even if patrons did pay expenses as such a plan which would equalize charges to expenses as between years of light traffic and years of heavy traffic would be inequitable.

It is asserted in the order that accrued depreciation would be the amount deductible in ascertaining rate-base value.

It is evident that for companies whose primary depreciable accounts were scaled down, the basis for accruing depreciation would be different from that used by the commission in valuation proceedings. . . .

The order provides that operating steam railroad companies shall include in operating expenses charges and credits for depreciation, extraordinary repairs, and retirements of property leased upon the same basis as for owned property. Under most leases the lessee is not liable to the lessor for this theoretical depreciation, the lease providing merely that the property be returned at the termination thereof in as good condition as when received. Certainly in such cases the excess of the accruals for depreciation over the actual expenditures for maintaining the property would not represent an expense to or a liability of the lessee, or a loss of value in anything that the lessee owns, and by no stretch of the imagination can it be considered that the lessee's profit and loss account is overstated by the amount of "past-accrued depreciation" that would be set up. The property on which it would be accrued does not belong to the lessee and is not on its books as an asset. The setting up of these amounts on the books of the lessee would be in violation of fundamental accounting principles and manifestly wrong.

Past Depreciation Charged to Capital Instead of Operation

In the order the commission finds that depreciation, as defined in the law, is an *operating expense,* but it then provides that so-called past-accrued depreciation shall be charged to profit and loss (invested capital), because: "It is the latter account (profit and loss) which has profited in the past from the failure or partial failure to accrue depreciation charges." Throughout the order the commission recognizes that if the railroads are gradually being used up and consequently decreasing in value, and it holds that they are, patrons should pay for the property used up and a fair return besides; and asserts that the way to accomplish this is to include in operating expenses, by depreciation charges, the cost of the property used up. The accounts have been stated according to regulations prescribed by the commission—generally operating expenses have not included anything for depreciation of fixed properties; have been accepted by the commission as true and correct; have been the basis of its actions with respect to rates and other matters; have been considered true and correct by railroad executives and directors and by investors; and have been the basis upon which the companies paid dividends and issued securities and upon which investors purchased securities. Under the rates fixed by the commission, net railway operating income, without charges in operating expenses for this past-accrued depreciation, has not represented a fair return upon a value fixed by the commission on the basis of reproduction cost at 1914 prices, *less depreciation.* Under the commission's assumption that there is an expense of operation in excess of the cost of maintaining a railroad in 100 per cent condition, represented by "depreciation," if a depreciation accounting plan is to be made effective it should provide for charging to operating expenses in the future the amounts not so charged in the past to afford the railroads an opportunity, no matter how remote, of collecting it from patrons. There is no justification in law or equity for setting it up on the books by a charge to profit and loss account. Under this provision several billion dollars would be immediately set up on the books as past-accrued depreciation in an effort to correct what the commission asserts to have been error in stating the operating expense, net income, and surplus accounts in the past under its accounting regulations. This would impair the credit of the railroads and shake the faith of all in the commission's accounting regulations. The railroads have no liability for such amount and accordingly surplus is not overstated on their books. Despite the commission's theory that there is a loss of value represented by expired life in the millions of parts, the railroads are more valuable and have a greater capacity for service than ever before.

It is inconceivable, in view of this, that the commission should require carriers to write down by several billion dollars the surplus as it is stated on their books under its long existing accounting regulations. The offsetting of the credit to the depreciation reserve of the so-called past-accrued depreciation by a charge of the same amount to a suspense account on the assets side of the balance sheet, as provided in the order, would not avoid the impairment of credit, etc. The commission asserts that the amount represents an impairment of the surplus and admits that the suspension of it on the assets side is merely an effort to avoid the harm which would result if it were not thus camouflaged. . . .

Freight Car Loading

CARLOADINGS during week ended November 12 totaled 974,862. A detailed statistical compilation of the carloadings for the week ended November 12 will appear in the *Railway Age* of December 3.

Car Loading in Canada

Colder weather and the Thanksgiving Day holiday (on Armistice Day in Canada) affected revenue car loadings at stations in Canada for the week ended November 12, the total being 76,520 cars, or a decrease from the previous week of 8,837 cars, but an increase of 1,447 cars over the same week last year.

	Total for Canada			Cumulative Totals to Date	
Commodities	Nov. 12 1927	Nov. 5 1927	Nov. 13 1926	1927	1926
Grain and grain products	22,370	25,972	21,183	407,551	413,891
Live stock	3,950	3,448	3,464	103,929	100,496
Coal	8,449	8,517	8,544	313,011	270,852
Coke	567	412	508	16,155	16,900
Lumber	3,039	3,286	3,196	170,040	164,775
Pulpwood	1,214	1,034	1,232	132,841	116,551
Pulp and paper	2,342	2,279	2,449	99,538	107,140
Other forest products	2,935	2,938	2,634	136,941	138,977
Ore	2,101	2,049	1,607	77,113	79,653
Merchandise, L. C. L.	14,915	18,161	15,363	775,267	739,792
Miscellaneous	14,638	17,261	14,893	681,689	651,136
Total cars loaded	76,520	85,357	75,073	2,914,075	2,800,163
Total cars received from connections	31,742	36,071	36,353	1,692,566	1,685,259

View from Center of Track 2 on the B. & A. at Becket

New England Roads Report Progress

Traffic restored on most through routes except two of those to Canada—Permanent reconstruction begun

THE New England roads have made material progress since the report published in last week's *Railway Age* in restoring normal operation following the disastrous floods of November 3 and 4. Most of the roads now have service restored on through routes, sometimes by a few slight detours or over single tracks where two or three tracks are normally provided. There is, of course, much temporary work which will have gradually to be replaced by permanent construction, but in general, on most of the principal routes through service has been restored. There are two important exceptions, i.e., the main routes of the Canadian National and the Canadian Pacific into New England territory, both of which require detours and may for some time yet, particularly that of the Canadian National via its subsidiary, the Central Vermont, which perhaps suffered more intensively from the fury of the flood than any other New England carrier.

Reports of the situation on individual railroads follow:

Boston & Maine Restoration Nears Completion

A map prepared by the Boston & Maine to show the damages to its lines as a result of the floods indicated track washed out at 129 locations, slides at 17 places, 20 bridges or culverts out, 22 bridges partly out or washed, and track under water at 14 points. There were 880 miles of railroad affected localized in particular on four main traffic routes: (a) the Fitchburg division to the west; (b) the line via Plymouth, N. H., to Wells River, Vt., where connection is made with the Canadian Pacific to form the Boston-Montreal route via the C. P. R.; (c) the line to White River Junction, Vt., where connection is made with the Central Vermont forming the Boston-Montreal route via the C. N. R.; and (d) the Connecticut river line which forms a link in the New York-Montreal route via the New Haven, the B. & M. and then beyond White River Junction, the Central Vermont, or Canadian National.

All of these lines are now restored for through traf-

B. & M. Near Westminster

One-Half Mile of Main Line, Both Tracks, Swept Off Embankment and Turned Over—One Track Put Back in Place by Hand Labor.

fic as far as the Boston & Maine is concerned. The double-track Fitchburg division is still operating, however, with a 10-mile stretch of single track. The C.P.R. will not complete the restoration of its line north of Wells River immediately and it will probably be even

longer before the Central Vermont will be able to interchange traffic as formerly at White River Junction.

During the past week the chief progress made on the Fitchburg division was the reduction of line not yet restored for double-track operation from 13½ to 10 miles. The 13½ mile stretch operated since the second day after the flood as single-track about midway between Mechanicville, N. Y., and the Hoosac Tunnel, or from

The Connecticut River Cut Another Course at Bellows Falls

Eagle Bridge, N. Y., to North Pownal, Vt. Between these points the railroad follows the course of the Hoosick river, but in places the east-bound track is at some distance from the westbound. In the flood, two bridges were displaced on one line and an embankment washed out on the other. The plan was adopted of putting the portions of track remaining together as a single track, this operation requiring, for example, in one instance a cross-over line 700 ft. long with a change in grade of 10 ft. as between the eastbound and westbound tracks. During the past week double-track operation has been restored on 3½ miles between Petersburg Junction and Hoosick Falls and it is expected that 3 miles additional will be made ready during the coming week for double track operation between Petersburg Junction and North Pownal.

On account of the cut in the Boston & Albany's line at Becket, Mass., this division of the B. & M. was called upon to handle drag freight detoured from that carrier for several days. As a result all records for traffic through the Hoosac Tunnel were broken when on November 12, 1,550 eastbound cars were moved and on November 13, 1,685 cars. The best previous record was 1,237 cars reported for one day in March, 1920. The record was made possible, in spite of single-track operation for 13½ miles and slow orders, by the movement of trains in fleets and by discontinuance of passenger service between North Adams and Troy, for which buses of the Boston & Maine Transportation Company were utilized. Up to the present time the only passenger train operating between North Adams and Troy is the "Minute Man."

The line via Plymouth to Wells River was injured by several washouts midway between the two points named and the loss of a bridge. The line was restored Tuesday night of the present week, but it is not expected the through Boston-Montreal service via the regular C. P. R. route will be restored for sometime. In the meantime the C. P. R. traffic has been handled via Somerset Junction and the Maine Central, the Boston & Maine receiving it at Portland, Me. The latter route was damaged by the floods but restored in about 4 or 5 days.

The Boston & Maine line to White River Junction was restored after about 10 days and the branch from White River Junction to Wells River has been in service since November 17. The Central Vermont, as outlined above, will be unable to operate through to White River Junction for sometime. At present C. V. or C. N. R. traffic is moving to Boston and Maine points via the C. N. R.'s line to Portland.

The Boston & Maine management takes pride in the fact that it went through the flood and the restoration period still underway without having to place a single embargo. While it had a total of 880 miles of line affected, it had restored service on 646 miles inside of a week. Rehabilitation activity, which began the evening of November 3, the day on which the flood occurred, was centered at Boston in the office of the chief engineer, a system was adopted of reports from the field to headquarters each 2 or 3 hours. All telephone messages were abstracted for a written record and daily reports sent in each night were used as the basis for figuring the requirements for transportation, material and men. The road had the advantage of having many intercommunicating branches which by assisting facility of access permitted work to proceed in many places at once. There were 7 or 8 major operations put under way. Some 4,500 men were used on repair jobs, exclusive of the work done at points of lesser damage by section gangs. The record shows that up to November 18, the maintenance department had shipped 41 cars of second-hand timber for blocking, 630,000 ft. board measure of bridge timber, 36,000 lineal feet of piling, 5,600 cars of gravel, sand, dirt or cinders for fills and 430 cars of rip rap. On one occasion material for 500 feet of trestle was procured and loaded on cars in 24 hours. One gravel pit loaded 100 cars daily for several days. The co-operation

What Happened to the B. & A. Near Becket, Mass.

of the transportation department and a favorable motive-power condition were important contributing factors.

The Boston & Albany

The Boston & Albany is now operating single track for 9,200 ft. east of the station at Becket, Mass., one track having been restored on November 15. The Boston & Albany suffered a washout of both tracks on its

busy main line on November 4, one day after the worst part of the storm, due to the failure of a reservoir at Becket, Mass. This put an excessive volume of water in the Westfield river which the B. & A. parallels at this point. East of Becket 3½ miles of track were damaged including the loss of one stone and two steel bridges. The road solved the problem of handling its business first by effecting an arrangement with the Boston & Maine for a route to be used by both roads via the B. & A. from Albany to Pittsfield and the North Adams branch and thence via the Fitchburg division of the Boston & Maine east to Ayer. Through passenger trains to and from the westward fast freight service were detoured

B. & M. Stone Arch Swept Away Near Hoosick Junction

over the New Haven from Springfield, Mass., to Mott Haven (New York City) and thence over the Hudson division of the New York Central. This increased the distance between Boston and Albany from 200 miles to a total of 350 but in spite of the additional 150 miles through trains were moved with but 3½ to 5 hours delay.

The break at Becket was repaired with the help of 4 B. & A. and 3 New York Central bridge gangs and two contracting firms, the latter working from the two ends of the break respectively. The break was joined by single track 11 days after the break occurred. By November 18, the new single track section was handling 100 train movements daily.

The Canadian Pacific

The Canadian Pacific has been a heavy sufferer in the floods—particularly on the line from Newport, Vt., to Wells River (64 miles), which it acquired from the Boston & Maine. Service on this line was opened from Newport south to Lyndonville (35 miles) the beginning of the week. However, between that point and Wells River (29 miles) the damage has been heavy.

The company has placed all the men and equipment possible in the affected area, stationing gangs at various points all the way down to Wells River. Gangs are working both northward and southward from St. Johnsbury and the company has a total of about 1,500 men employed in reconstruction work. There are two pile drivers in service with steam shovel equipment working in local pits to provide filling and ballast material.

Considerable of the damage to the C. P. R. line resulted from the rise of water to heights where it not only attacked embankments but also flowed through cuts, scouring them and washing out the track. There has in addition to track and bridge damage been much wreckage of station and signal facilities. Steel bridges on the whole stood up well, only one having failed and that one because of the collapse of an abutment.

The spirit of the employees in aiding the company in its restoration work has been remarkable, all classes volunteering to work where needed in any capacity regardless of their regular occupations.

The company is hopeful of restoring service on this route at a comparatively early date, but progress depends greatly on the persistence of relatively moderate weather. A heavy freeze, such as may be expected in Vermont almost any time now, would have the effect of greatly slowing up reconstruction progress.

C. P. R. trains between Montreal and Boston are now detouring via Somerset Jct. (Me. C.) and Portland (B. & M.). As soon as the line is opened to St. Johnsbury (9 miles south of Lyndonville) a shorter detour will be possible. Only one passenger train each way a day is now being run (at night) via the detour. Freight business is routed the same way.

The Canadian Pacific also suffered some flood damage in the Eastern Townships of Quebec but service has been restored in this area.

The Canadian National

The Canadian National suffered some damage in the Eastern Townships but delays were temporary. Its chief problem lies in the the damage suffered by the Central Vermont, its United States subsidiary over which service to both Boston and New York is offered. While operation of this line is suspended Boston trains are operating via the Grand Trunk (C.N.R.) line to Portland and thence to Boston via the B. & M. Freight to Southern New England is moving via Grand Trunk to Portland; thence via B. & M. to Millers' Falls, Mass., the Central Vermont line being undamaged south of that point.

The "Montrealer" and the "Washingtonian," which operate normally via the Central Vermont, the Boston & Maine and the New Haven through Springfield, New Haven and over the Hell Gate Bridge route into Pennsylvania Station, New York, have been detoured via Rouses Point (Delaware & Hudson), Troy (New York Central) —then down the N. Y. C.'s Hudson division to Mott

At Montpelier on the C. V.—Such Accumulations of Wreckage Menaced the Most Substantial Bridges

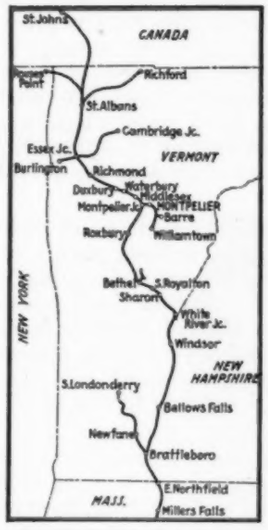
Haven (New York City), thence over Hell Gate. Some change may have been made in this routing by the time these lines appear in print, due to reopening of additional restored line.

Central Vermont

The Central Vermont has undoubtedly been more unfortunate in its experience with the flood than most roads operating in New England territory. At the beginning of this week, two and a half weeks after the initial washouts, it still had 72 miles of its main line

out of service—much of it badly damaged, and requiring considerable work before it will again be restored.

And yet, great progress has been made since the waters subsided. The main line south from St. Albans to Richmond (33 miles) has been opened. North and south of White River Jct., a 27-mile stretch of main line has been restored. Through service on the stretch of Boston & Maine track between Windsor and Brattleboro (49 miles), over which the Central Vermont operates by trackage rights, is now possible. Service has been restored southward from Brattleboro to East Northfield (11 miles). The South Londonderry branch is in operation between Brattleboro and Newfane (13 miles) and trains are again running on the Missisquoi Valley branch (28 miles). The line from Essex Jct. to Cambridge (26 miles) should be open by the time this issue of the *Railway Age* appears.



Northern Portion of the Central Vermont

Work yet remaining to be done includes, besides the restoration of the main line between Richmond and Sharon (72 miles) referred to above, the following branch lines: Essex Jct. to Burlington (8 miles); Montpelier to Williamtown and Barre (17 miles); Newfane to South Londonderry (13 miles). This gives a grand total of 110 miles of line yet to be restored and virtually all of it represents very heavy work. Four bridges are out and several are badly damaged, much embankment is gone and but little of this mileage does not need some work on it.

The company forces are facing a grave danger in the possibility of a heavy freeze occurring before the reconstruction is complete. Such an eventuality would slow down the progress greatly.

Embankment Gone and Stone Arch Nearly So, Near Northfield Falls

Complete outfits—pile driver, steam shovels, bridgemen, track gangs and work trains bringing in filling material, ballast, and track and bridge supplies—are working northward from White River Jct. and southward from Essex Jct. Two other complete outfits are working into Montpelier from the east on the Montpelier & Wells River. As soon as these two outfits reach Montpelier Jct., one will be able to work southward to meet the outfit proceeding northward from White River Jct., and the other can proceed northward to meet the Essex Jct. outfit.

In addition to these complete outfits, a number of motor truck and tractor gangs are at work at several points not open to rail service. These gangs have tractor shovels, motor trucks and bridgemen. At the beginning of this week the men occupied exclusively in reconstruction work totaled in the neighborhood of 2,000—including 1,700 track laborers and 125 bridgemen. A total of 35 teams and 40 motor trucks also were being utilized.

Undermined Bridge Abutment Near North Duxbury

One of the earliest washouts occurred at Roxbury. A work train with a pile driver and a bridge gang were at once dispatched northward from White River Jct., but this work train did not reach its destination. It was marooned at South Royalton with a bridge out behind it at Sharon. The resourceful foreman laid a stretch of track and turned the piledriver around, heading it toward Sharon, so that pile driving on the trestle to replace the washed out Sharon bridge is now proceeding on both sides of the river.

Speed in reconstruction work has been aided by a high degree of morale on the part of employees, whose efforts to do all they can for their company is noticeable to every observer. The road also has been aided materially by the parent company, the Canadian National, which has placed materials, equipment and skilled personnel at its disposal. Connecting lines have also been of assistance by co-operating in the attack of mutual difficulties.

The severity of the damage done on the Central Vermont lies in the fact that, suffering with other railroads the rises in the streams generally, it also had to contend particularly with the Winooski river valley, which was probably the most severely affected section in

New England. The Central Vermont runs in this valley from Montpelier to Essex Jct. and Burlington (41 miles). Its line also parallels the Dog river, a tributary of the Winooski, for about 10 miles, the White river for about 40 miles and the Connecticut river for some distance. It also has a branch line in the Missisquoi Valley. There are two or three other relatively important streams which cross it roughly at right angles. Such streams in nearly all cases caused washouts and damage to bridges, but, naturally, were not able to inflict mile after mile of virtual demolition such as that which a stream on the rampage can inflict on a railroad running for miles in its valley.

An Abutment Failure Near Bethel on the C. V.

Special Difficulties Encountered

There are some major cases of damage which call for considerable ingenuity in their repair. At a point called Slip Hill, between Waterbury and Middlesex in the Winooski valley, the railroad was located on a bench about 1,200 ft. long at the foot of a mountain, and 40 or 50 ft. above the river which ran along at the foot of this bench. The flood completely obliterated the bench on which the track lay. To put the track through again will involve the making of a new bench by cutting and filling, which work is now in progress.

At North Duxbury, also in the Winooski valley, a "hogback," or projecting hill of low elevation, constricts the river valley. The railroad runs through this hogback in a cut. When the water rose high enough it also went through the cut, scouring it thoroughly and coming out on the other side with such force that it completely demolished a 40-ft. embankment 2,000 ft. in length and washed out an important bridge. At Bethel another large bridge is out. There are other equally important casualties among railway structures and reconstruction everywhere will involve heavy engineering work, but the examples mentioned serve to give a general idea of the character of the problem which faces the company's forces.

Probably the greatest single factor in the destruction of railway bridges was the highway bridges which were carried by the flood and piled up against the railway structures. The territory has—or rather had—a great many of the old-fashioned covered wooden bridges to carry its highways across streams. Such structures naturally floated easily and menaced gravely the heavier railway structures down stream—particularly when their force was augmented by several floating houses.

The Boston & Maine on its line between Windsor and Brattleboro, used by the Central Vermont as a part of its main line, has had an interesting problem presented to it at Bellows Falls by reason of the Connecticut river having cut a secondary channel between its large bridge and the town. By several switching movements, however, movement through the town can be accomplished without using this bridge.

Among the difficulties which the railroad has faced in connection with reconstruction not the least important is that of communication. After the initial washouts on November 3 the headquartres office at St. Albans was for several days without definite information as to the nature and extent of the damage. Even at this writing communication by wire is far from satisfactory and over much of the route highways as well as railways having been washed out, the only sure method of surveying the territory is by proceeding over it afoot. The first definite work of the extent of the damage in the Winooski valley and northward was received in St. Albans from a brakeman on November 5, two days after the flood. The brakeman was on a train which was marooned at Roxbury. He returned to St. Albans, 72 miles, afoot with definite reports on the nature of the damage.

The stricken area is under military control and available roads cannot be used without a military pass, a restriction made necessary by the difficulty of getting in necessary food and other supplies over the limited passable highways remaining. If unlimited highway facilities permitted all portions of the line to be easily reached by motor truck and if communication were swift and easy, the problem of rehabilitation would be measurably simplified.

New fears, and some minor actual damage, arose on Novmber 17 when further heavy rains fell in the area. Aside from a few minor cases of bank washing, however this rain did little more than slow up the reconstruction work for a day or two. Progress henceforth—that is whether the road will be restored in a few weeks or whether a much greater period will be required for the work—depends largely on the weather, and particularly the temperature.

A Short Stretch of Complete Destruction

Nearing Normal on Rutland

The Rutland had its lines sufficiently restored by Sunday night, November 20, to resume the operation of its night express trains, with sleeping cars each way between New York and Montreal. Some of the day trains were also put in operation, but daylight service is limited because of the necessity of giving up the tracks to large numbers of work trains. It was planned to resume regular milk and freight trains on Monday of this week (November 21).

New Executives For Seaboard

Robert L. Nutt and L. R. Powell, Jr., succeed the late Mr. Warfield as chairman and president respectively

ROBERT L. NUTT has been elected chairman of the board of directors of the Seaboard Air Line and L. R. Powell, Jr., has been elected president of the company. The two newly named executives succeed the late S. Davies Warfield, who was both chairman and president. Mr. Powell heretofore has been vice-president and comptroller and Mr. Nutt has been vice-president, secretary and treasurer.

Mr. Nutt was born in North Carolina in 1873 and entered the service of the Seaboard in 1892 as a clerk in the office of the general manager. During his rise in the official ranks of the company it has grown from a line of some 600 miles to one of almost 5,000, and he has as a part of his duties been intimately connected with the solution of financial and management problems arising from consolidation and reorganization. He was intimately associated with the Seaboard's post-war rehabilitation program, including the Florida extension. Mr. Nutt's first official position was that of cashier, to which position he was appointed in 1900. A year later he was elected assistant secretary and assistant treasurer and in 1906 he became treasurer of the company. During this period his headquarters were at Portsmouth, Va. At the beginning of federal control he declined appointment as federal treasurer of the Seaboard and went to New York as secretary and treasurer of the corporation. Shortly thereafter he was elected also vice-president.

Mr. Powell was born in Virginia 43 years ago and began his railroad career with the Seaboard as a clerk in the office of the auditor of passenger accounts in Portsmouth, Va., in 1902. Later he was transferred to the office of the comptroller and was promoted through successive stages in that department until 1918, when he was elected vice-president and comptroller, with headquarters at Baltimore.

Both Mr. Nutt and Mr. Powell were intimately associated with the late Mr. Warfield in the building up of the Seaboard property, and both are members of the committee named in accordance with the terms of Mr. Warfield's will to keep his holdings of Seaboard securities intact and to vote them in such a way as to continue the plans and fulfill the hopes of the late president with regards to the management and further development of the Seaboard's property. That members of this committee, as Mr. Powell and Mr. Nutt are, have not only been entrusted with voting the stock along lines laid down by Mr. Warfield, but have also been placed in executive positions in active management of the property, would seem to provide double assurance of a continuation of the policies which have drawn general attention to the Seaboard in recent years. It will be noted that both the new executives have spent practically their entire business careers with this company.

In assuming office, Mr. Powell announced his intention to carry out the policies of his predecessor, and spoke in praise of the South, which he said "offers the greatest opportunity for development of any section of our country." Continuing, he asserted as his belief that "while development has been conspicuous during the past several years, the next few years should show a growth in agricultural and manufacturing pursuits, and along commercial lines, far beyond anything which has yet been

R. L. Nutt

L. R. Powell, Jr.

realized." The recent rapid expansion of the Seaboard, he said, should not be taken as an indication that the road has completed its program of development. Rather "the decade ahead of us should see each succeeding year through the intensive development of the existing system, the cumulative and permanent results that were so clearly foreseen by Mr. Warfield in his conception of a transportation system such as the Seaboard is destined to be."

Mr. Nutt expressed similar convictions: "The progressive policies which have guided this railroad to its present commanding position will be continued under the present management. No effort will be spared to make the Seaboard an even greater self-contained transportation system to serve the people of the Southern territory which is rich in natural resources and susceptible of development to a greater extent than perhaps any other section of the country."

Cars Iced Rapidly on the Union Pacific

SEVERAL interesting records have been made by the Union Pacific in handling eastbound perishable freight during the present season, particularly as to the icing of cars. The peak days at the various icing stations were as follows:

Station	Date	Total cars perishables handled	Total cars iced
Ogden, Utah	Sept. 25	1,421	1,245
Ogden, Utah	Oct. 4	1,450	1,444
Laramie, Wyo.	Sept. 26	1,751	1,570
North Platte, Neb.	Sept. 27	1,768	1,621
Council Bluffs, Ia.	Sept. 28	1,420	1,334

At the North Platte station, 27,146 cars were iced between September 18 and October 14, an average of over 1,000 cars a day. On the peak day at North Platte, remarkably fast time was made. One train containing 87 cars of perishables, 73 of which required icing, was placed at the platform at 3.10 p. m. and the icing was completed at 3.40 p. m., the actual icing time being 30 min., or an average of 2.43 cars per minute. Another train containing 80 cars of perishables, all of which required icing, was placed at 10.30 p.m., and the icing was completed at 11.05 p. m., with 35 min. icing time, or an average of 2.28 cars per minute.

The North Platte icing plant is of concrete construction, equipped with horizontal ammonia compressors with Corliss steam drive. The capacity of the plant is 375 tons, with a storage capacity of 13,168 tons. The icing platform is of the island type, 80 car-lengths long, with a spotting capacity of 160 cars.

The Ogden plant has vertical electrically-driven ammonia compressors. The manufacturing capacity is 375 tons per day and the storage capacity 21,257 tons. It has two icing platforms of the island type, one being 68 car-lengths long and the other 70, the total spotting capacity being 276 cars.

At Laramie, natural ice is cut from a pond adjacent to the ice-house. The storage building is one of the largest in the country, containing 16 rooms. The total length of the building is 961 ft. 6 in., the width 108 ft., and the height 34 ft. The icing platform is of the island type, 78 car-lengths long, with a spotting capacity of 156 cars.

The Council Bluffs plant is equipped with electrically driven ammonia compressors, has a manufacturing capacity of 260 tons per day and a storage capacity of 21,405 tons. It has two island type platforms, one 85 and the other 15 car-lengths long, with a total spotting capacity of 200 cars.

Looking Backward

Fifty Years Ago

The Fitchburg Railroad has put at all crossings the following notice: "Stop and look each way for a train before crossing the track." The necessity for this comprehensive caution is evident when it is remembered how apt trains are to approach road crossings with little or no warning.—*Railway Age*, November 29, 1877.

The first of the "consolidated" type of freight locomotive to be built in the West is now being erected at the Louisville shops of the Louisville & Nashville. With a weight of about 49 tons it is expected that it will be able to handle 35 cars over grades of 75 ft. to the mile.—*Chicago Railway Review*, November 24, 1877.

The most remarkable feat on record in connection with locomotive building has been performed at the shops of the Michigan Central at Jackson, Mich., where two new engines were completely put together and set in motion in 2 hours and 55 minutes on November 16. The work was done by two gangs of 14 men each.—*Railway Age*, issue of November 29, 1877.

Twenty-Five Years Ago

The Western Maryland has awarded a contract for the construction of a line from Cherry Run, W. Va., to Cumberland, Md., 60 miles, to effect a connection with the West Virginia Central & Pittsburgh [now a part of the W. M.] and provide a continuous line between Baltimore, Md., and Huttonsville, W. Va.—*Railway Age*, November 28, 1902.

A report of the Texas railroad commission covering free transportation for the year ending June 30, 1902, shows that in that time railroads under its jurisdiction issued 29,386 annual and 317,290 time and trip passes. Of the total number of passes, 28,378 were issued to persons within the classification of "editorial, public, specials, religious, charity and personal.—*Railway Age*, November 28, 1902.

The largest freight movement within a limited territory ever heard of took place in and out of Pittsbugh, Pa., on November 23 when the Pennsylvania, the Ft. Wayne, the Pan Handle, the Baltimore & Ohio and the Pittsburgh & Lake Erie moved 46,225 cars in 929 trains in a period of 24 hours ending at 5 A. M., November 24, in order to clear up a blockade of three months' duration.—*Railroad Gazette*, issue of November 28, 1902.

Ten Years Ago

The Railroads' War Board through a committee of railway traffic officers has drafted a list of 450 commodities whose transportation it is believed could be dispensed with without any serious inconvenience to the public. About 75 additional commodities are listed as those with which the public could dispense but not without inconvenience. No articles on these lists have yet been denied transportation.—*Railway Age Gazette*, November 23, 1917.

S. Davies Warfield, chairman of the board of directors of the Seaboard Air Line, before a meeting of the Investment Bankers' Association opposed a proposed act of Congress which would make federal incorporation of interstate railroads compulsory as a way out of the present transportation chaos. He contended that such an act would be unconstitutional, that it would leave railroad credit impaired, that it would make government ownership far easier of accomplishment and that it would deprive states of their states' rights.—*Railway Age Gazette*, November 23, 1917.

Communications and Books

To Thwart the Sympathetic Juryman

BOSTON, MASS.

TO THE EDITOR:

Many a railroad lawyer will rejoice at the Supreme Court decision reported by you on November 5, pages 872 and 909, in which Mr. Justice Holmes clarifies that provision of universal American law that any person approaching a railroad track is bound to "LOOK OUT FOR THE ENGINE."

In Massachusetts, this injunction was formerly painted in vivid letters eight or ten inches high and on an overhead sign *spanning the highway;* and that style of sign was in vogue for many years—long enough for everybody possessing a mind to thoroughly absorb its truth.

Unfortunately, however, the bad habit of sinning against light has not only persisted down to the present day, but, since the automobile era came in, has even increased in its lusty health and pervasiveness. Everybody knows what he ought to do at railroad crossings!

For the true significance of this decision—so characteristic of Justice Holmes' combined legal acumen, human sympathy and Yankee commonsense—one must emphasize those last two lines, referring to the Delaware & Hudson case; and then read between the lines. The reason that lawyers are rejoicing today is not because of any radically new law, but because they have a new and definite argument with which to head off the reference of damage suits to juries when there is no good reason for such reference except the complaisance of easy-going judges. Juries are allowed to decide cases in accordance with their sympathetic friendship for the so-called poor, when the question to be passed upon has already been decided by the courts. Innumerable suits for damages at crossings have gone against the railroads (or have been settled out of court by large payments of money) simply because juries are so full of compassion for what they indulgently look upon as the oppressed humble citizen.

It will still be possible for lawyers to allege all sorts of puzzles as to what large or small difficulties the motorist had to contend with, or what excuses he may have had; or what gross carelessness might be attributed to the locomotive engineman; and cunning lawyers will still find ways to put questions before juries which ought to be decided by the judge; but we may hope that such cases will be fewer than heretofore.

Reckless motorists give precious little thought to how their conduct would appear to a court, and we shall forever be afflicted with a percentage of drivers on whom all advice or admonition is wasted; but there may now be hope that the breed of damage-suit lawyers will be somewhat educated in decency and fairness, if not reformed.

The Supreme Court decision has been followed (of course) by innumerable editorials in the daily press, the most noticeable result of which is to put added emphasis on the exceeding complication and difficulty of this country-wide problem of saving fools from their folly. That problem is, indeed, almost insurmountable except as crossing grades can be separated.

The other problem, that of seeing that all grade crossings are made as safe as possible for sane and reasonable drivers, still calls for more attention than it receives. Neglect to cut down trees obstructing the view, or to erect and *maintain* adequate signs is a fault frequently observable. It is every driver's duty to know the road that he is traveling, whether night or day, fog or no fog; but the fact must be accepted that many well-meaning people ignore this duty, and railroads and town officers must take pity on them. The last country crossing that the writer inspected while on vacation this summer was one where the standard "RR" disk, and a 400 ft. warning, were both obscured by brush or had been mutilated by stone-throwers.

And, this was in New Hampshire, which was the first state to take definite action toward requiring universal approach warnings. The word that I have italicized is much needed.

G. M.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Les Chemins de Fer Romantique 1827-1927, by Jehan de Villejean. Seventeen large color plates accompanied by historical text selected to emphasize the romantic aspects of railroad history prepared on the occasion of the French railway centenary last June. Bibliography of French and English sources. Portfolio. Pub. by Gaston Jeanbin, Paris, France. About $7.50.

Oklahoma—An Index to the State Official Sources of Agricultural Statistics, compiled by Icelle E. Wright. Includes a list of unofficial sources compiled by Margaret Walters. References on shipments and freight rates are given under each commodity. A list of railroad pamphlets on Oklahoma is on p. 452-453. Agricultural Economics Bibliography No. 21. Pub. by Library, Bureau of Agricultural Economics, 460 p. U. S. Department of Agriculture, Washington, D. C. *Apply.*

Union-Management Co-operation—A Selected Bibliography, compiled by Laura A. Thompson. Reprinted from October, 1927, Monthly Labor Review. "Union-management co-operation on the railroads" p. 223-226. p. 220-227. Pub. by Library, U. S. Department of Labor, Washington, D. C. *Apply.*

Periodical Articles

Inaugural Address—Main Line Electrification, by Roger T. Smith. A survey of electrification chiefly in Europe, especially the Swiss Federal and British railways. An appendix contains table showing approximate length of route of standard gauge railway electrified in various parts of the world. Journal of the Institute of Transport, November, 1927, p. 9-31.

Novel Oil Transport Used in Germany. Small tank containers each mounted on its own wheels that can be loaded aboard flat cars. Illustrated. Scientific American, November, 1927, p. 442-443.

The Practical Value of Railway Statistics, by F. H. Graveson. Five practical questions which carefully prepared statistics help to answer. Journal of the Institute of Transport, November, 1927, p. 32-41.

Statistics of Rail Breakages During the Year 1926. The 10th International Railway Congress in 1925 decided to have extensive statistics of rail breakages compiled and published. This table shows by railway systems, by age of rail, and by general type of rail (i. e. light, medium, or heavy) the figures for 1926. Bulletin of the International Railway Congress Association, October, 1927, p. 837-920.

A MILE A MINUTE is the speed reported as having been made by a 38 ft. motor boat on Long Island Sound, near Cold Spring Harbor, N. Y., on November 20, the boat carrying 24 persons or a weight of about 4,000 lb. The trip was made to test the merits of a fan-tail device attached to the stern of the boat below the surface of the water, which is said to accomplish the hitherto unattainable combination necessary to give the load capacity of a displacement boat with the speed of a sea-sled. The fantail, 6 ft. wide and 4 ft. long, is said to be exactly like the tail of a fish. The new device was devised by Johannes Plum, a former secretary at the Danish Legation at Washington, and the test was managed by Wm. B. Leeds, Jr.

Odds and Ends of Railroading

With anniversary celebrations in full swing and more in prospect, it should be noted that The Rail-Road Advocate, the first railway periodical, was published at Rogersville, Tenn., from July 4, 1831, to June 14, 1832.

England and Germany Exchange Railway Officers

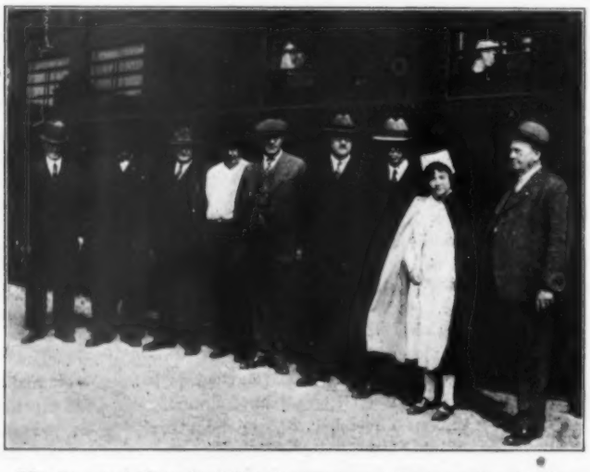
Persons familiar with academic customs in this country are well acquainted with the institution of the "exchange professor." An American university will lend a member of its teaching staff to a foreign institution for a year or two, and the foreign university will reciprocate by sending one of its staff to take the place of the instructor on leave. Both the American and the foreign professors are presumably better equipped for their permanent posts when they return by reason of their experience abroad.

The practice is now being extended to railways. An officer of the Great Western (England) will go to Germany to engage in similar work and his place will be taken during his absence by a German railway officer. Commenting on this exchange, the Railway Review (London), says in part:

"This, whilst quite a new departure for an English railway, has not come as a complete surprise due mainly to the modernized outlook which has been in operation on our railways, and the Great Western in particular. The fact that that company has sent one of its latest express engines out to the United States for show purposes marked a new departure, and now this proposed interchange of officers seems to indicate that the management side of the railways are on the look-out for fresh ideas. To all those with a progressive look-out this kind of thing will be welcomed, as it will foster an international viewpoint which should be useful to both parties."

Handling Deportees

The Southern Pacific engages on a large scale in the specialized work of handling deported aliens and aliens in transit through the country. Since most of this class of passengers are under a heavy bond and many of them are suffering from physical or mental infirmities, special care is required in handling this traffic. The aliens are handled in steel chair cars or coaches, the windows of which are protected with steel bars to prevent escapes.



Matron and Guards Who Accompany Deportation Train

A complete force of guards, under a chief transit and deport guard, is assigned to this service. Four guards are assigned to each car, working in six-hour shifts, two being on watch constantly, one at each end of the car. A matron is assigned to each party to take care of the female aliens. Graduate hospital nurses are used for this work. Since many of the aliens are being deported by reason of insanity, nurses with training in handling mental cases are preferred. The guards and matrons are employed by the railway, but the government supplies a doctor for each train.

The Southern Pacific has equipped special cars with kitchen facilities for serving meals to the aliens. These cars also have berths for the accommodation of the guards, doctors, immigration inspectors and matrons. The kitchen is equipped with standard dining car facilities.

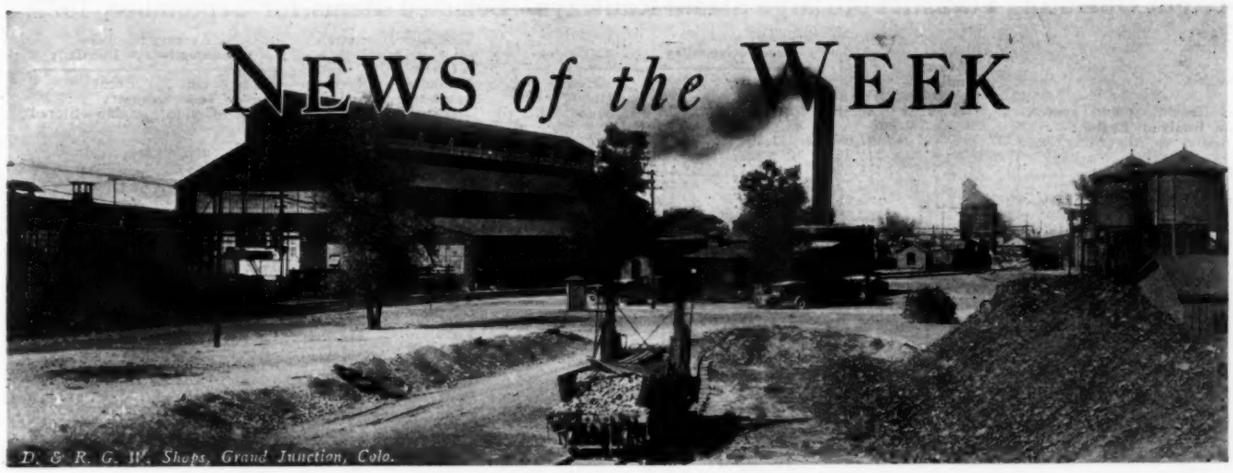
The aliens for deportation are assembled and moved in parties of one or more carloads. Westbound parties, consisting of Mexicans and Orientals, are assembled at New York and Chicago. From New York they are handled to New Orleans via Southern Pacific boats, thence by rail to Mexican border points and San Francisco. The aliens from Chicago are handled by rail on other lines to San Antonio, Texas, where they are consolidated with the parties from New York. Eastbound aliens are collected at San Francisco and are deported through Galveston, Texas and New York.

Interior of One of Cars Used in Alien Transportation

The aliens in transit through the country consist of those who are temporarily admitted, under bond, for the purpose of crossing the country enroute to their final destinations.

From the Reading Magazine

NEWS *of the* WEEK



D. & R. G. W. Shops, Grand Junction, Colo.

THE INTERSTATE COMMERCE COMMISSION, on petition of the Brotherhood of Railway and Steamship Clerks, Freight Handlers and Express and Station Employees, is to investigate the status of employees of the Trunk Line Association, acting under section 1, paragraph 5, of the Railway Labor Act of 1926, for the purpose of determining whether orders shall be issued amending or interpreting existing orders of the commission in Ex Parte 72. A hearing has been assigned for January 4 at Washington before Division 1 of the commission. In Ex Parte 72 the commission issued regulations designating classes of employees that are to be classed as "subordinate officials."

Purchases and Stores Division Meeting

Division VI—Purchases and Stores American Railway Association will meet at Atlantic City on June 13, 14 and 15, corresponding to the first three days of the meeting of the Mechanical Division and the opening of the big exhibit.

Consolidation Bill to Be Reintroduced

The Parker railroad consolidation bill is to be reintroduced at the opening of Congress in the same form in which it stood at the end of the last session, according to Chairman Parker of the House committee on interstate and foreign commerce, who said that he then expected to hold further hearings on the bill with a view to completing the revision of it which was begun at hearings during the last session. Mr. Parker said that Commissioner Hall of the Interstate Commerce Commission probably would be the first witness and that the bill in its tentative form has been considered since the last session by the Association of Railway Executives, the shippers, and others.

I. C. C. Jurisdiction Over Porters' Tips

The Interstate Commerce Commission has decided to hear arguments on the question of its jurisdiction to require the Pullman Company to "cease and desist from encouraging" the practice by which its porters derive a large part of their income from tips, which it has been asked to do in a complaint filed by the Brotherhood of Sleeping Car Porters. The motion of the Pullman Company to dismiss the complaint is to be assigned for oral argument at a date to be hereafter fixed.

The brotherhood in its complaint attempted to show that the matter is within the jurisdiction of the commission by dealing with the tip as part of the compensation paid by passengers for service and alleging violation of several sections of the interstate commerce act.

Reduction in Corporation Income Tax Proposed

A proposed reduction of the corporation income tax from 13½ per cent to 11½ per cent was approved on November 22 by the House ways and means committee, which has been holding hearings and meetings in advance of the regular session of Congress on the proposed tax-reduction bill. The Secretary of the Treasury had recommended a reduction to 12 per cent and the railroads had asked that the rate be cut to 10 per cent.

The Pennsylvania Limited

The Pennsylvania Limited, No. 5, the extra fare train leaving New York for Chicago at 1:05 P. M. and Chicago for New York at 5:30 P. M. has now been running 46 years; and on Saturday, November 19, the passengers in the dining car were treated each to a piece of a big birthday cake. A statement issued by the road says that this train has never missed a trip; that is to say, counting the trains both ways, it has completed 33,235 trips, representing a distance of about 30 million miles. When the train was first put in service, it had a "hotel car"; but after the first year of operation regular dining cars were substituted. The time from New York to Chicago at first was 26 hours 35 minutes, which was seven hours faster than any combination of trains previously operated between those cities. For several years following 1891, the cars were painted on the outside, below the windows a dark green, and above the window sills cream color, imitating an English fashion. The cars, though Pullmans, are now painted Tuscan red, the standard Pennsylvania color.

Fuel Statistics

The average cost of railroad fuel coal for the month of September was ten cents a ton more than the average for September, 1926, $2.69 as compared with $2.59, according to the Interstate Commerce Commission's monthly summary of railroad fuel statistics. This is compiled from reports for 172 Class I railways and includes only fuel for road locomotives charged to operating expenses. The average cost of fuel oil for the month was 2.71 cents a gallon, as compared with 2.97 cents in September last year.

For the nine months ended with September the railroads paid $189,209,596 for coal and $42,733,613 for fuel oil, making a total of $231,943,209, as compared with $236,276,308 in the corresponding period of last year, according to the statement. The consumption was less in both cases than that of last year.

Small Reduction in Canned Goods Rate from Pacific Coast Approved

A reduction from $1.05 to 90 cents per 100 lb., in the freight rate on canned goods in carloads from Pacific coast points to eastern defined territories, proposed by the transcontinental railroads, was found not justified, in a decision issued by the Interstate Commerce Commission on November 15 and the schedules suspended were ordered cancelled, without prejudice to the filing of a rate of 98 cents. "Consideration of the record leads to the belief that at the present rate of $1.05 the transcontinental carriers are laboring under a disadvantage in competing with intercoastal lines for the traffic in Pacific coast canned goods," the commission said in its report, "but it indicates also that the proposed rate is lower

(*Continued on page* 1060)

Freight Operating Statistics of Large Steam Railways—Selected Items for September, 1927,

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross, Excluding locomotive and tender	Ton-miles (thousands): Net, Revenue and non-revenue	Average number of locomotives on line daily: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany	1927	407	197,081	211,104	23,148	5,035	68.8	258,052	101,028	108	15	12.2	6
	1926	407	219,461	236,627	26,713	5,200	69.2	268,604	106,348	103	19	15.6	8
Boston & Maine	1927	2,075	435,890	507,235	45,466	11,557	70.3	626,468	254,051	276	72	20.7	32
	1926	2,143	462,730	533,693	48,780	13,248	73.6	650,892	272,901	304	96	24.0	43
N. Y., New H. & Hartf.	1927	2,140	552,911	597,679	40,456	16,124	68.8	839,123	346,889	332	55	14.3	63
	1926	2,162	562,887	588,136	36,389	16,492	70.4	854,475	367,230	314	62	16.6	29
Great Lakes Region:													
Delaware & Hudson	1927	875	342,954	461,035	50,694	10,126	65.6	633,801	311,675	251	31	11.0	86
	1926	875	367,336	496,864	53,959	10,965	68.4	682,067	349,729	247	36	12.7	77
Del., Lack. & Western	1927	999	547,685	622,177	77,318	18,057	69.5	995,964	426,393	241	53	18.0	13
	1926	999	579,628	674,080	87,056	19,271	71.7	1,066,403	480,807	260	45	14.9	19
Erie (inc. Chic. & Erie)	1927	2,317	990,115	1,089,667	103,777	40,385	65.2	2,413,450	1,009,480	433	145	25.0	3
	1926	2,323	1,082,276	1,192,177	155,351	42,861	68.0	2,500,072	1,082,435	569	107	15.8	118
Lehigh Valley	1927	1,345	570,777	625,258	73,918	18,174	65.1	1,079,319	472,492	361	77	17.5	59
	1926	1,346	601,973	665,997	85,085	19,678	67.5	1,156,697	537,127	394	90	18.5	53
Michigan Central	1927	1,820	567,483	583,353	21,019	18,889	61.6	1,067,879	387,907	230	63	21.5	46
	1926	1,835	590,290	605,565	20,726	20,163	63.6	1,114,571	415,774	258	45	14.9	99
New York Central	1927	6,478	1,895,859	2,120,227	144,962	77,550	63.6	4,631,505	1,994,119	1,107	256	18.8	330
	1926	6,482	2,080,161	2,365,627	167,106	*1,908	64.3	4,920,618	2,173,571	1,183	296	20.0	322
New York, Chic. & St. L.	1927	1,665	586,415	596,997	7,978	20,291	66.9	1,107,542	431,500	238	50	17.3	63
	1926	1,665	663,990	671,127	8,540	21,866	69.5	1,156,495	456,659	238	54	18.3	43
Pere Marquette	1927	2,180	461,945	468,270	6,383	12,037	64.5	708,979	309,972	182	42	18.6	9
	1926	2,179	479,129	489,080	7,455	12,285	65.5	711,214	309,653	189	30	13.7	10
Pitts. & Lake Erie	1927	231	113,121	115,151	2,502	4,397	63.6	341,174	198,837	58	18	23.4	16
	1926	231	133,556	134,661	1,465	4,914	66.1	373,143	219,368	67	15	18.6	21
Wabash	1927	2,497	696,583	734,108	11,661	22,169	66.2	1,224,446	470,941	327	49	13.1	82
	1926	2,497	749,921	778,488	11,821	24,364	70.6	1,315,230	549,092	331	52	13.6	50
Central Eastern Region:													
Baltimore & Ohio	1927	5,540	2,061,713	2,428,594	201,629	62,056	62.3	4,161,772	2,016,871	1,071	210	16.4	76
	1926	5,519	2,123,949	2,467,976	190,445	64,340	64.3	4,186,912	2,055,400	1,057	202	16.0	58
Central of New Jersey	1927	691	260,865	284,192	51,441	7,677	58.6	518,036	242,636	188	28	12.8	25
	1926	691	272,121	293,769	33,055	8,343	60.9	539,402	258,719	213	48	18.4	42
Chicago & Eastern Ill.	1927	945	274,751	283,181	4,240	7,270	64.4	454,064	214,266	124	41	24.8	44
	1926	945	263,688	264,543	3,656	7,819	65.5	467,454	220,256	131	40	23.4	45
Clev., Cin., Chic. & St. L.	1927	2,374	765,302	803,908	23,364	24,706	61.0	1,625,248	757,828	333	98	22.8	38
	1926	2,374	763,199	806,611	21,396	25,156	63.6	1,601,430	766,282	352	68	16.1	46
Elgin, Joliet & Eastern	1927	461	130,297	137,080	5,411	3,755	65.4	279,829	148,464	82	13	13.3	4
	1926	460	126,716	134,226	4,961	3,760	66.2	281,344	150,752	74	18	19.9	1
Long Island	1927	396	51,170	56,423	15,135	753	59.2	46,911	18,525	47	9	16.7	1
	1926	393	47,754	52,034	13,744	766	59.9	47,019	18,870	44	13	22.3	...
Pensylvania System	1927	10,844	4,364,643	4,827,550	399,714	142,192	64.8	9,239,303	4,314,084	2,874	372	11.5	661
	1926	10,883	4,848,676	5,295,851	412,993	147,713	66.0	9,606,627	4,665,414	2,786	471	14.5	335
Reading	1927	1,131	603,887	655,992	64,953	16,498	61.0	1,152,729	580,149	313	74	19.0	50
	1926	1,129	617,823	677,279	67,414	17,827	63.3	1,218,118	634,999	367	59	13.8	76
Pocahontas Region:													
Chesapeake & Ohio	1927	2,708	1,252,334	1,357,660	54,141	42,860	56.4	3,472,085	1,883,472	542	95	15.0	20
	1926	2,650	1,240,152	1,307,588	45,112	42,451	58.3	3,387,879	1,877,129	535	104	16.3	25
Norfolk & Western	1927	2,232	881,293	1,078,838	38,198	32,545	59.6	2,678,649	1,447,824	556	51	8.3	126
	1926	2,231	963,199	1,186,236	52,267	35,143	59.9	2,952,779	1,642,277	565	56	9.0	104
Southern Region:													
Atlantic Coast Line	1927	5,096	619,621	626,308	9,403	16,307	63.8	898,305	356,742	434	56	11.4	131
	1926	4,931	709,657	719,802	11,711	18,932	65.1	1,040,279	421,984	447	50	10.1	100
Central of Georgia	1927	1,898	266,111	269,983	7,478	7,426	74.4	376,863	160,394	140	21	12.9	14
	1926	1,905	332,474	337,248	7,545	8,214	72.0	441,857	198,183	154	20	11.3	4
I. C. (inc. Y. & M. V.)	1927	6,595	2,004,942	2,033,285	44,411	56,750	64.1	3,624,960	1,592,907	789	99	11.2	12
	1926	6,555	1,990,653	2,011,431	44,683	57,627	64.9	3,594,896	1,566,617	746	100	11.8	5
Louisville & Nashville	1927	5,048	1,766,943	1,843,782	59,061	37,411	59.4	2,621,443	1,274,213	642	90	12.2	20
	1926	5,021	1,736,252	1,823,978	55,176	35,974	61.8	2,454,507	1,217,754	597	111	15.7	12
Seaboard Air Line	1927	4,282	480,060	491,965	5,746	12,516	67.2	684,981	284,915	235	54	18.8	39
	1926	3,904	506,849	521,771	7,382	13,491	67.2	743,193	317,094	258	32	11.0	24
Southern Railway System	1927	8,021	1,892,371	1,923,821	32,517	50,261	67.6	2,726,328	1,126,085	1,075	151	12.3	114
	1926	8,050	1,994,143	2,031,369	36,789	50,967	68.8	2,775,163	1,174,887	1,078	176	14.0	46
Northwestern Region:													
Chic. & North Western	1927	8,463	1,573,619	1,671,689	37,571	44,084	66.5	2,406,428	989,809	773	125	13.9	63
	1926	8,457	1,625,281	1,698,986	27,905	42,534	63.9	2,451,300	1,020,816	752	149	16.5	105
Chic., Milw. & St. P.	1927	11,202	1,895,190	2,024,839	127,643	57,157	65.1	3,443,523	1,541,428	826	128	13.4	106
	1926	11,175	1,769,837	1,880,939	103,988	52,482	63.4	3,051,901	1,301,712	867	170	16.4	152
Chic., St. P., Minn. & Om.	1927	1,724	347,069	376,186	15,453	7,761	72.2	426,104	193,512	168	23	11.8	18
	1926	1,724	318,857	346,697	14,985	6,755	67.7	367,049	154,277	164	30	15.6	2
Great Northern	1927	8,165	1,084,974	1,120,871	60,151	41,379	63.8	2,660,506	1,284,271	571	120	17.4	85
	1926	8,138	1,144,384	1,183,029	65,680	41,891	59.9	2,746,995	1,270,224	587	126	17.7	72
M., St. P. & S. Ste. M.	1927	4,368	692,908	713,161	7,424	18,763	66.5	1,074,979	518,294	312	21	6.4	4
	1926	4,372	570,268	584,291	4,758	14,916	68.2	818,330	381,154	301	29	8.7	14
Northern Pacific	1927	6,486	1,018,973	1,080,355	53,542	33,485	68.5	1,957,335	911,710	484	136	21.9	25
	1926	6,510	953,341	1,010,193	56,140	32,263	69.0	1,774,745	765,571	512	131	20.4	61
Oreg.-Wash. R. R. & Nav.	1927	2,154	232,810	245,414	17,932	7,227	71.9	421,019	200,681	136	11	7.6	8
	1926	2,161	235,252	250,643	23,777	7,141	71.1	416,812	193,107	143	22	13.2	8
Central Western Region:													
Atch., Top. & S. Fe (incl. P. & S. F.)	1927	10,404	1,994,382	2,204,144	147,533	69,667	64.5	4,154,423	1,408,287	809	140	14.8	120
	1926	10,244	2,061,083	2,276,619	159,416	71,302	66.7	4,114,068	1,465,777	838	129	13.4	86
Chicago & Alton	1927	995	298,070	323,549	1,999	7,458	63.2	438,162	164,336	144	16	10.2	37
	1926	1,022	346,669	394,961	7,238	8,933	64.6	520,017	207,820	139	22	13.7	22
Chic., Burl. & Quincy	1927	9,334	1,517,602	1,588,732	73,061	46,434	64.0	2,625,678	1,146,121	750	160	17.6	67
	1926	9,349	1,668,603	1,734,223	70,637	51,444	62.3	3,012,707	1,330,184	798	194	19.6	65
Chic., Rock I. & Pacific	1927	7,575	1,318,095	1,372,748	14,843	34,837	63.8	2,043,658	853,404	555	121	17.9	61
	1926	7,572	1,287,198	1,327,874	15,643	33,680	68.2	1,827,555	765,759	542	142	20.7	78
Denver & R. G. Wn.	1927	2,561	332,136	392,945	63,591	8,659	64.3	513,405	206,518	249	36	12.5	15
	1926	2,575	348,513	422,680	81,867	9,592	68.7	541,400	228,188	252	36	12.5	18
Oregon Short Line	1927	2,539	369,347	397,408	34,972	11,092	68.4	650,477	271,017	181	24	11.7	25
	1926	2,537	384,782	419,877	39,751	11,538	66.8	673,315	272,385	197	21	9.7	29
Sou. Pac.—Pac. Lines	1927	8,770	1,813,129	1,988,595	309,157	55,983	62.7	3,436,418	1,202,554	788	181	18.6	55
	1926	8,625	1,731,182	1,895,275	303,256	54,700	65.5	3,233,047	1,192,792	795	174	18.0	55
Union Pacific	1927	3,712	1,495,724	1,540,518	88,547	55,707	66.8	3,176,568	1,074,091	457	36	7.3	77
	1926	3,694	1,524,095	1,562,513	82,085	56,812	67.5	3,194,889	1,102,399	491	40	7.6	83
Southwestern Region:													
Gulf, Colo. & S. Fe	1927	1,933	288,203	297,170	7,777	9,192	60.9	580,573	245,859	143	19	12.0	35
	1926	1,897	353,241	375,507	10,463	10,710	60.4	691,977	304,837	135	17	11.0	8
Mo.-Kans.-Tex.	1927	1,787	260,438	263,376	4,748	9,599	61.0	566,335	224,428	103	17	14.2	34
	1926	1,787	259,640	260,858	4,191	9,700	63.6	540,600	210,254	96	26	21.0	25
Mo.-Kans.-Tex. of Tex.	1927	1,389	170,381	174,149	2,737	5,024	64.0	281,541	111,986	114	13	10.1	55
	1926	1,389	197,873	205,833	3,587	5,759	66.1	322,311	134,177	102	32	23.9	38
Missouri Pacific	1927	7,331	1,366,936	1,410,405	43,857	38,402	63.9	2,295,213	962,349	569	89	13.5	48
	1926	7,311	1,466,391	1,520,698	48,418	42,512	67.1	2,420,415	1,039,655	565	84	12.9	...
St. Louis-San Francisco	1927	4,926	798,961	812,521	8,295	20,515	63.5	1,231,866	526,751	395	59	12.9	74
	1926	4,874	834,059	853,667	14,972	20,845	64.3	1,215,148	501,245	438	57	11.6	71
Texas & New Orleans	1927	4,553	772,161	774,966	2,078	17,540	63.9	1,042,051	422,224	268	49	15.6	35
	1926	4,469	711,212	712,031	3,345	16,890	69.6	921,004	375,714	273	59	17.7	51
Texas & Pacific	1927	2,015	308,540	308,540	2,929	9,065	62.6	536,214	200,727	169	27	13.8	27
	1926	1,953	269,564	269,564	592	7,861	65.9	441,662	169,221	149	35	19.1	24

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Compared with Sept., 1926, for Roads with Annual Operating Revenues Above $25,000,000

Region, road and year	Average number of freight cars on line daily: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotive and tender	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles including locomotive and tender	Locomotive miles per locomotive-day
New England Region:													
Boston & Albany.....1927	2,951	5,385	8,336	2.8	17,694	1,309	513	20.1	404	29.3	8,274	176	63.3
1926	2,310	5,606	7,916	4.4	15,074	1,224	485	20.5	448	31.6	8,712	167	71.9
Boston & Maine.....1927	13,334	12,376	25,710	7.4	15,123	1,437	583	22.0	329	21.3	4,081	116	52.9
1926	12,429	15,066	27,495	7.6	14,791	1,407	590	20.6	331	21.8	4,244	125	48.6
N. Y., New H. & Hartf..1927	20,631	18,149	38,780	13.5	18,788	1,518	627	21.5	298	20.1	5,403	112	54.9
1926	19,650	23,095	42,745	19.3	18,107	1,518	652	22.3	286	18.3	5,663	119	55.3
Great Lakes Region:													
Delaware & Hudson.....1927	8,053	6,155	14,208	4.5	22,348	1,848	909	30.8	731	36.2	11,871	137	60.4
1926	7,767	6,970	14,737	5.2	22,268	1,857	952	31.9	791	36.3	13,320	148	64.8
Del., Lack. & Western...1927	15,482	8,601	24,083	4.0	22,031	1,818	779	23.6	590	35.9	14,223	131	79.5
1926	13,625	10,394	24,019	4.5	21,885	1,840	830	24.9	667	37.3	16,038	133	83.0
Erie (inc. Chic. & Erie)..1927	31,979	22,316	54,295	4.8	28,282	2,438	1,020	25.0	620	38.1	14,521	122	68.9
1926	31,031	24,268	55,299	8.0	26,897	2,310	1,000	25.3	652	38.0	15,533	119	66.4
Lehigh Valley 1927	21,582	9,974	31,556	10.5	25,710	1,891	828	26.0	499	29.5	11,707	139	53.3
1926	20,409	11,475	31,884	6.6	24,795	1,922	892	27.3	562	30.5	13,307	140	51.8
Michigan Central 1927	15,557	15,520	31,077	5.2	27,441	1,882	684	20.5	416	32.9	7,106	102	68.8
1926	13,143	17,867	31,010	5.0	26,327	1,888	704	20.6	447	34.1	7,553	106	69.0
New York Central.....1927	63,944	70,902	134,846	4.2	29,280	2,443	1,052	25.7	493	30.2	10,261	100	55.4
1926	57,373	78,774	136,147	4.0	27,331	2,365	1,045	26.5	532	31.2	11,177	109	57.1
New York, Chic. & St. L..1927	12,715	12,046	24,761	5.7	25,324	1,889	736	21.3	581	40.8	8,639	96	70.2
1926	10,705	11,782	22,487	6.5	23,450	1,742	688	20.9	677	46.7	9,143	103	77.7
Pere Marquette 1927	8,976	10,132	19,108	4.4	18,678	1,535	671	25.8	541	32.5	4,739	99	70.6
1926	8,989	12,913	21,902	3.6	16,847	1,484	646	25.2	471	28.6	4,737	105	75.5
Pitts. & Lake Erie.....1927	12,203	8,794	20,997	4.2	33,887	3,016	1,758	45.2	316	11.0	28,635	89	51.9
1926	10,287	9,668	19,955	6.5	28,772	2,794	1,643	44.6	366	12.4	31,592	97	55.4
Wabash 1927	15,131	11,783	26,914	2.8	27,763	1,758	676	21.2	583	41.5	6,287	98	56.1
1926	13,762	14,724	28,486	2.7	25,021	1,754	732	22.5	643	40.4	7,330	116	68.7
Central Eastern Region:													
Baltimore & Ohio.....1927	69,738	36,884	106,622	5.8	20,591	2,019	978	32.5	631	31.1	12,136	143	68.4
1926	65,966	42,952	108,918	4.5	19,545	1,971	968	31.9	629	30.6	12,414	154	70.4
Central of New Jersey...1927	18,771	10,980	29,751	5.4	19,882	1,986	930	31.6	272	14.7	11,706	150	51.9
1926	17,149	12,677	29,826	5.3	18,225	1,982	951	31.0	289	15.3	12,482	143	41.7
Chicago & Eastern Ill....1927	12,788	4,682	17,470	31.0	22,431	1,653	780	29.5	409	21.5	7,557	131	58.1
1926	12,037	5,287	17,324	24.2	22,578	1,773	835	28.2	424	23.0	7,768	119	52.4
Clev., Cin., Chic. & St. L..1927	17,253	21,741	38,994	5.5	26,288	2,124	990	30.7	648	34.6	10,642	110	64.0
1926	14,441	23,521	37,962	6.0	25,385	2,098	1,004	30.5	673	34.7	10,759	113	65.7
Elgin, Joliet & Eastern...1927	8,949	6,995	15,944	5.5	15,493	2,148	1,139	39.5	310	12.0	10,735	113	50.5
1926	9,069	6,917	15,986	5.5	15,871	2,220	1,190	40.1	314	11.8	10,923	124	50.4
Long Island 1927	1,689	5,895	7,584	1.9	5,072	917	362	24.6	81	5.6	1,560	246	42.3
1926	1,855	7,172	9,027	1.1	5,269	985	395	24.6	70	4.7	1,599	229	38.8
Pensylvania System 1927	206,897	86,965	293,862	6.3	23,346	2,117	988	30.3	489	24.9	13,261	118	53.7
1926	199,891	93,661	293,552	9.1	20,526	1,981	962	31.6	530	25.4	14,289	125	58.4
Reading 1927	24,209	12,651	36,860	2.8	21,445	1,909	961	35.2	525	24.5	17,093	151	62.2
1926	26,487	13,994	40,481	3.1	20,858	1,972	1,028	35.6	523	23.2	18,746	143	58.3
Pocahontas Region:													
Chesapeake & Ohio.....1927	26,866	16,803	43,669	2.9	30,404	2,773	1,504	43.9	1,438	58.0	23,185	90	73.8
1926	30,003	12,375	42,378	2.7	29,140	2,732	1,514	44.2	1,476	57.3	23,610	90	70.6
Norfolk & Western.....1927	26,696	10,349	37,045	1.2	40,110	3,039	1,643	44.5	1,303	49.2	21,626	127	61.4
1926	30,240	12,022	42,262	1.2	37,466	3,066	1,705	46.7	1,295	46.3	24,533	130	66.5
Southern Region:													
Atlantic Coast Line.....1927	21,907	7,836	29,743	5.8	18,261	1,450	576	21.9	400	28.7	2,334	111	43.3
1926	21,255	11,849	33,104	3.6	17,586	1,466	595	22.3	425	29.3	2,853	113	49.1
Central of Georgia.....1927	4,209	6,188	10,397	2.9	18,769	1,416	603	21.6	514	32.0	2,817	128	57.4
1926	4,784	7,103	11,887	6.5	17,031	1,329	596	24.1	556	32.0	3,468	141	66.4
I. C. (inc. Y. & M. V.)..1927	38,803	30,509	69,312	6.9	22,707	1,808	794	28.1	766	42.6	8,051	117	78.0
1926	37,956	30,823	68,779	3.9	22,617	1,806	787	27.2	759	43.0	7,966	121	81.0
Louisville & Nashville...1927	39,554	21,380	60,934	11.2	17,252	1,484	721	34.1	697	34.5	8,413	140	86.7
1926	40,723	19,111	59,834	13.0	16,625	1,414	701	33.9	678	32.4	8,084	150	88.4
Seaboard Air Line.....1927	14,845	7,427	22,272	6.5	17,297	1,427	593	22.8	426	27.9	2,218	134	57.2
1926	12,497	9,030	21,527	3.1	16,704	1,466	626	23.5	491	31.1	2,707	129	60.8
Southern Railway System.1927	53,978	26,497	80,475	6.5	19,434	1,441	595	22.4	466	30.8	4,680	141	53.2
1926	51,472	27,917	79,389	5.3	18,121	1,392	589	23.1	493	31.1	4,865	149	55.0
Northwestern Region:													
Chic. & North Western...1927	46,892	32,349	79,241	7.1	19,050	1,529	629	22.5	416	27.9	3,898	114	63.4
1926	47,229	30,853	78,082	7.0	19,034	1,508	628	24.0	436	28.4	4,023	127	63.9
Chic., Milw. & St. P....1927	53,748	32,512	86,260	5.0	22,405	1,817	813	27.0	596	33.9	4,587	120	75.3
1926	53,291	26,599	79,890	6.4	21,096	1,724	735	24.8	543	34.5	3,883	128	63.8
Chic., St. P., Minn. & Om.1927	2,942	11,259	14,201	8.8	15,209	1,228	558	24.9	454	25.2	3,742	113	68.3
1926	3,002	8,925	11,927	11.6	14,116	1,151	484	22.8	431	27.9	2,984	126	62.2
Great Northern 1927	43,182	20,846	64,028	4.1	27,184	2,452	1,184	31.0	669	33.7	5,243	110	57.0
1926	42,234	22,079	64,313	5.7	27,144	2,400	1,110	30.3	658	36.2	5,203	114	58.4
M., St. P. & S. Ste. M..1927	21,108	9,128	30,236	3.5	18,034	1,551	748	27.6	574	31.3	3,955	92	72.0
1926	20,894	7,473	28,367	4.2	16,400	1,435	668	25.6	448	25.7	2,906	103	59.5
Northern Pacific 1927	38,037	13,825	51,862	5.5	23,423	1,921	895	27.2	586	31.4	4,686	127	61.0
1926	35,250	10,033	45,283	6.3	23,497	1,862	803	23.7	564	34.4	3,920	133	55.2
Oreg.-Wash. R. R. & Nav.1927	7,847	7,066	14,913	3.7	20,898	1,808	862	27.8	449	22.5	3,105	157	59.5
1926	7,846	5,590	13,436	3.8	20,430	1,772	821	27.0	479	24.9	2,979	168	55.4
Central Western Region:													
Atch., Top. & S. Fe 1927	56,738	19,398	76,136	5.1	29,525	2,083	706	20.2	617	47.3	4,512	105	82.6
(incl. P. & S. F.).....1926	55,475	25,183	80,658	4.6	27,260	1,996	711	20.6	606	44.1	4,769	110	84.0
Chicago & Alton.....1927	9,699	5,490	15,189	4.7	19,020	1,470	551	22.0	361	25.9	5,505	148	67.8
1926	9,080	5,977	15,057	6.1	18,085	1,500	599	23.3	460	30.6	6,779	154	83.1
Chic., Burl. & Quincy...1927	44,309	24,880	69,189	5.9	22,502	1,730	755	24.7	552	34.9	4,093	120	60.9
1926	45,935	23,120	69,055	5.2	22,755	1,806	797	25.9	642	39.8	4,743	129	60.6
Chic., Rock I. & Pacific..1927	30,046	24,055	54,101	5.5	19,137	1,550	647	24.5	526	33.7	3,755	121	68.4
1926	31,480	23,702	55,182	7.8	17,468	1,420	595	22.7	463	29.8	3,371	137	65.5
Denver & R. G. Wn.....1927	10,343	6,248	16,591	2.7	16,099	1,546	622	23.9	415	27.1	2,689	188	53.5
1926	10,695	6,737	17,432	3.7	16,395	1,553	655	23.8	436	26.7	2,954	192	58.4
Oregon Short Line.....1927	8,634	6,519	15,153	4.3	22,891	1,761	734	24.4	596	35.7	3,558	115	70.2
1926	7,886	5,923	13,809	4.7	22,582	1,750	708	23.6	658	41.7	3,579	123	70.3
Sou. Pac.—Pac. Lines...1927	36,200	32,526	68,726	5.1	22,281	1,895	663	21.5	583	43.3	4,571	118	79.1
1926	33,237	33,613	66,850	5.8	21,991	1,868	689	21.8	595	41.6	4,610	120	75.7
Union Pacific 1927	20,865	12,419	33,284	9.0	38,518	2,124	718	19.3	1,076	83.5	9,644	103	110.2
1926	20,220	12,090	32,310	10.3	37,370	2,096	723	19.4	1,137	86.8	9,947	108	103.3
Southwestern Region:													
Gulf, Colo. & S. Fe.....1927	8,698	5,467	14,165	3.8	27,047	2,014	853	26.8	579	35.5	4,240	92	62.8
1926	9,253	6,646	15,899	3.4	26,449	1,959	863	28.5	639	37.2	5,356	100	84.6
Mo.-Kans.-Tex. 1927	8,583	4,478	13,061	4.8	29,376	2,175	862	23.4	573	40.1	4,186	93	74.6
1926	8,109	4,773	12,882	4.5	26,887	2,092	810	21.7	544	39.5	3,922	91	72.8
Mo.-Kans.-Tex. of Tex...1927	283	9,689	9,972	8.3	19,994	1,652	657	22.3	374	26.3	2,687	96	46.5
1926	286	10,942	11,228	8.0	20,163	1,629	678	23.3	398	25.9	3,219	100	52.1
Missouri Pacific 1927	27,607	20,638	48,245	5.6	22,381	1,679	704	25.1	665	41.6	4,376	119	73.7
1926	26,133	24,573	50,706	5.5	20,813	1,651	709	24.5	683	41.6	4,740	122	80.7
St. Louis-San Francisco..1927	20,655	11,394	32,049	3.6	20,152	1,542	659	25.7	548	33.6	3,564	139	60.3
1926	19,404	13,707	33,111	4.2	18,052	1,457	601	24.0	505	32.6	3,413	144	58.5
Texas & New Orleans....1927	11,410	16,420	27,830	4.9	18,085	1,350	547	24.1	506	32.9	3,091	101	81.6
1926	10,680	16,566	27,246	5.6	16,837	1,295	578	22.2	460	29.7	2,802	103	71.9
Texas & Pacific.....1927	6,051	6,364	12,415	6.0	21,522	1,738	651	22.1	539	38.9	3,320	98	53.0
1926	5,761	6,172	11,933	3.4	20,256	1,638	628	21.5	473	33.3	2,887	105	48.8

News of the Week

(*Continued from page* 1057)

than necessary to meet the competition to a reasonable degree." Commissioner McManamy, concurring in part, said that there was nothing in the record to justify the suggested rate of 98 cents, and Commissioner Aitchison, dissenting in part, said he felt that the proposed reduced rate of 90 cents had been justified. The intercoastal water rate is 45 cents.

New Canadian National Station at Montreal

Officers of the Canadian National exhibited to the city authorities and other interested parties, on November 11, preliminary plans and models of the extensive new station which is to be built at Montreal to take the place of the present historic structure. The new station is to front on Cathcart Street, with auxiliary entrances at sides and rear. The tracks will be below the street level and extensive room above is to be provided for offices. The station will cover two blocks, between Cathcart Street and Lagauchetiere Street.

The railroad lines leading to the station from the west will be reconstructed and there will be important changes in location, the line for much of the distance to be above the level of the street. On the line to Victoria bridge there will be built a new bridge across Lachine Canal. At Commissioners Street, a line will branch off to the east. The tracks leading to Toronto and Ottawa are also to be changed and use will be made of the Mount Royal tunnel. The arrangement of the connection to the North Shore line is not yet settled, but Moreau Street passenger station will be discontinued. Bonaventure station will be retained for a perishable freight station.

Commercial Stocks of Coal

Consumers' stocks of bituminous coal on October 1 are estimated at 61,900,000 net tons in a report of a survey made by the Bureau of Mines and the Bureau of the Census. From 63,400,000 tons, the revised figure for July 1, stocks declined to 60,100,000 tons on August 1; but during August and September production exceed consumption and the net decrease from July 1 to October 1 was only 1,500,000 tons.

Exports were normal during the period from July 1 to October 1, averaging 351,000 tons a week. Home consumption averaged 8,360,000 tons as against 9,050,000 in the corresponding months of 1926, the decrease of 7.6 per cent reflecting diminished activity in the steel, automobile, and other industries.

The present survey shows, in addition to the stocks of consumers, 9,905,547 tons of bituminous coal and 1,108,310 tons of anthracite on the docks of Lakes Superior and Michigan. In comparison with October 1, 1926, this is an increase of 32 per cent bituminous and a decrease of 3 per cent anthracite.

Stocks of railroad fuel declined during July, but increased slightly in August and September. From July 1 to October 1 there was a net decrease of 1,270,000 tons and the total on hand October 1, as reported by the American Railway Association, was 16,510,000 tons. In comparison with the corresponding date of 1926, this was an increase of 5,296,000 tons.

S. P. Shopmen Return to Work

Striking shopmen of the Southern Pacific of Mexico at Empalme, Sonora, returned to work on October 31 following a decision of the recently formed Board of Conciliation and Arbitration which declared the strike to be illegal inasmuch as the employees failed to give the labor board a 10-day advance notice of their action. As a compromise the labor board requested that all men be returned to their work, allowing the road to put into effect an earlier request for a five-day week of 40 hours during seasons of slack business. The immediate cause of the strike, which took place while the request for a five-day week was pending, was the discharge of a machinist for insubordination, other employees in the shops joining in a general sympathetic strike. The five-day week request was submitted to the Board of Conciliation and Arbitration, as provided under the Mexican Constitution of 1917, only after conferences of labor committees with the general manager had failed to bring about an agreement. A recent disagreement over the interpretation of a clause in the working agreement between the Southern Pacific and its trainmen and enginemen has been decided by the labor board, in favor of the railway, the employees abiding by that decision.

Supreme Court Declines to Review Kansas City Southern Valuation

The Kansas City Southern failed in its effort to obtain a review by the Supreme Court of the United States of the valuation methods and principles of the Interstate Commerce Commission when the court declined on November 22, from the bench, to review the Commission's order on the ground that the case was controlled by its decision of last February in the Los Angeles & Salt Lake case. In that decision the court held that an order of the commission fixing a valuation was not reviewable until actually used by the commission in a rate or other case.

The case was on an appeal by the government from a decision of the district court, which had ordered the commission's order set aside, but in the Supreme Court the commission, in its brief, merely argued that the railroad's bill should be dismissed on the ground that the case was controlled by the earlier decision. After Blackburn Esterline, assistant to the attorney general, had argued a few minutes, the court said he need go no farther and after hearing S. W. Moore, general counsel for the Kansas City Southern for over an hour, it announced that an order would be entered for a dismissal.

The Kansas City Southern contended that the valuation actually had been used against the road in a way to injure its credit, and in its brief invoked the general equity power of the court over the acts of the commission. Whereas the company claimed a value of $80,000,000, the commission's figure was $49,016,268, which the lower court held was too low. The company contended that the existence of this valuation report had disabled it from making a consolidated mortgage bond issue, that the commission had used the valuation figures for the purpose of calculating its excess income and as evidence in the case in which the western railroads unsuccessfully sought a general advance in rates, as well as in the consideration of its application for authority to acquire control of the Missouri-Kansas-Texas and St. Louis Southwestern, which was denied.

Points for the Freight House Man

Milk of magnesia and salad dressings are among the things which, when handled in a freight house, must be made the object of special care in cold weather, because they are liable to damage from freezing. This and a dozen other interesting suggestions will be found in a circular which has been issued by C. H. Allan, superintendent of freight claim prevention of the Grand Trunk (Detroit, Mich.). Rough handling of freight is one of the first points in this circular, claims under this head having been found to be increasing, even while, as a whole, payments for lost and damaged freight have not increased.

Careless omission of names from waybills when a car of freight is stopped off for partial unloading, has made trouble in some cases. It is noted that when a car is billed to "order, notify" the stop-over privilege cannot be granted. When notation is made of goods over, short or damaged, the time when the note is written is an important element. When a consignee discovers damage after goods have arrived at this store and requests the agent to call and make an inspection, care should be taken to respond at the earliest possible moment. If such a visit is made too late, its purpose is defeated; and after a time the consignee loses interest and will not report with promptness.

It is extremely easy to make a notation of damage to freight—which, in the good old times consisted simply in writing two letters "BO"—and it is suggested to agents, checkers and everybody, that after making a notation one should give a slight twist to his imagination and assume that he is the claim investigator who will have to read and interpret the note, some days or weeks afterward. Thus obscure wording will be avoided.

One way of responding to a charge that there has been negligence in your freight house, is to set up an argument that the facts are not as stated; that some other fellow is at fault, etc; this style of argument is characterized as shadow boxing which, says the circular, is a discreditable thing to indulge in. The explanation that a certain laborer's blunder was due to his being new at the job has no element of satisfaction for the claim agent.

The circular ends with a list of the bulletins which have been issued by the United States Department of Agriculture on packing for domestic shipment, cooperage, fibre containers, etc., and it is suggested that agents, by writing to Washington for these pamphlets and sending a few cents might add materially to their knowledge of their own work.

Traffic

The Ohio Valley Shippers' Advisory Board will hold its 16th regular meeting at Hotel Gibson, Cincinnati, Ohio, on Tuesday, December 13. In the evening, the Cincinnati and Miami Valley Traffic Clubs will give a dinner in honor of the Board.

The movement of milk from Philadelphia, Baltimore and Washington to Boston, to meet the emergency occasioned by the floods in Vermont and New Hampshire, had amounted on November 18, to 132 cars, or about 1,500,000 quarts, as reported by the Pennsylvania.

The Interstate Commerce Commission has issued a decision finding not justified an increase proposed by the New England railroads in the rates on iron and steel articles, l.c.l., between New England points, which had been suspended. A proposed increase in the carload rates, which also was suspended to December 16, is still under consideration.

A special committee of the Association of Land Grant Colleges and Universities, appointed to study the agricultural situation, recommended at the annual meeting of that organization at Chicago on November 17 that the investigation of freight rates on agricultural products authorized by Congress under the Hoch-Smith resolution be pushed to completion.

The Interstate Commerce Commission has approved a modification of the plan previously authorized for joint passenger train-service by the Northern Pacific and the Minneapolis, St. Paul & Sault Ste. Marie between the Twin Cities and the head of the lakes, with a division of the earnings, so as to include the Great Northern in the pooling arrangement.

Lettuce shipments from the Imperial valley in California have increased from 62 carloads in 1920 to 12,787 carloads in 1926, according to figures compiled by the freight traffic department of the Southern Pacific. With the present season's shipping yet to be completed, car loadings already show a further increase of 506 cars. Shipments for the intervening years were 1921, 101 cars; 1922, 770 cars; 1923, 2,305 cars; 1924, 4,545 cars, and 1925, 7,935 cars.

The Interstate Commerce Commission has assigned part 8 of the general rate structure investigation, involving freight rates on cottonseed, its products and related articles, and a large number of separate cases involving rates on those articles, for hearing or further hearing before Examiners Money and Esch on December 5 at New York and on January 6 at Fort Worth, Tex. A hearing also will be held at San Antonio following that at Fort Worth and another at Houston if necessity arises. These hearings are for the presentation of shippers' evidence. Further notice will be issued regarding hearings for the evidence of the carriers.

The Interstate Commerce Commission has suspended from November 15 until June 15, 1928, the operation of tariff schedules, proposing to revise the proportional rates on grain from Chicago and Peoria, Ill., and related points, on traffic originating in the Northwest and destined to points in Central Freight Association territory, and also to establish joint through proportional rates on wheat and flour from Duluth, Minneapolis and St. Paul, Minn., Kansas City, Mo., Omaha, Nebr., and related Missouri River points to destinations in Central Freight Association territory.

The Southwestern railroads have petitioned the Interstate Commerce Commission to postpone the effective date of its order in the consolidated southwestern cases (in which it prescribed an extensive revision of freight rates in the Southwest on a mileage basis) for a minimum of 60 days from February 3. It is stated that it would be physically impossible for the carriers to file the tariffs by December 20, which would be necessary to give 45 days' notice as required by the order, and also that the commission will require considerable time to consider various petitions for modification of the order which have been filed by the roads and by the steamship lines and shippers.

The Interstate Commerce Commission has postponed to January 15 the effective date of its order of October 27 in the Southern Class Rate Investigation case, in which it directed the railroads to put into effect the revised basis of freight rates to and from points in Florida. It has also postponed to the same time the effective date of its Fourth Section Order No. 9200, denying further fourth section relief covering class rates involved in the case, except as to rates on packing house products and related articles; as to which the date was made April 15. The postponement was ordered on petition filed by Charles Barham, chairman of the Southern Freight Association.

The Freight Traffic Red Book

The Traffic Publishing Company, 150 Lafayette street, New York City, has issued the eighth annual volume of the well-known "Freight Traffic Red Book;" 768 pages with a large folded map. To the great volume and variety of information about freight classifications and freight laws; I.C.C. regulations, warehousing, car service and other cognate information, the present volume adds a half dozen new subjects: Air transportation, inland waterway rates, the investigation made by the Interstate Commerce Commission following the Hoch-Smith resolution, and other matters. Changes, by additions and revisions, have been made also in a dozen leading subjects which have been features of the book from the first.

Michigan Football Traffic

On the occasion of the Michigan-Minnesota football game at Ann Arbor, Mich., on November 19, over 20,000 spectators were transported from Minneapolis and St. Paul via Chicago to Ann Arbor in 15 special trains; and in addition to this the Michigan Central took 2,000 people from Chicago. Of the special trains, ten were run over the Chicago, Milwaukee & St. Paul to Chicago and thence by the Michigan Central. The Chicago & North Western ran three, of which two were delivered at Chicago to the Wabash and then moved from the Wabash to Ann Arbor over the Ann Arbor Railroad; and the third was taken from Chicago by the Michigan Central. The Chicago, Burlington & Quincy ran two special trains from St. Paul together with a third carrying the players, all of which were delivered to the Michigan Central at Chicago.

Longer Notice on New Southern Tariffs Suggested

The Interstate Commerce Commission, in a letter from Commissioner Eastman to the chairmen of freight committees in the East and South, suggests that the freight tariffs being prepared by the roads to comply with the order in the Southern Class Rate Investigation case be made effective on 40 days' instead of 30 days' notice in order to give interested parties as much time as reasonably possible to examine them. Also, because the carriers are pressed for time to prepare the rates to become effective December 27, the effective date of Fourth Section Order No. 9200 denying existing relief in connection with the class rates in question, the letter says the commission will give consideration to an application for an extension of not more than 13 days in the date of that order, in order to enable notice greater than 30 days to be given. The carriers expect at the same time to revise rates to and from various points not directly covered by the findings, such as rates between central territory and points in southern Virginia and rates between Virginia and North Carolina.

Reduction in California Fruit Rates Reaffirmed

The Interstate Commerce Commission, after further consideration, asked by the railroads, has reaffirmed the findings of its decision of July 20 in which it ordered reductions in the freight rates on fresh deciduous fruits, other than apples, from California to points in general east of the Rocky Mountains, based on the provisions of the Hoch-Smith resolution. The railroads in asking a reconsideration stated that unless it was granted they intended to contest the commission's interpretation in the courts. The commission's report on further consideration, by Commissioner Aitchison, is devoted mainly to a discussion of some objections made by the roads to its previous statements as to a cost study they had presented, but says that while consideration was given to the cost study it was not the controlling factor in the decision; but "numerous other pertinent matters of record were given proper weight." The other questions raised by the roads in their petition for reconsideration "including the interpretation and application of the governing laws," the report says, were considered and fully

determined in the original report. Commissioner Eastman, who concurred in part in the previous decision, dissented, and Commissioner McManamy said that the corrections made and comments thereon add force to the facts presented in his dissent expressed in the former report. Commissioner Hall did not participate.

Fares Reduced on Key System

The Railroad Commission of California, following a long investigation, has ordered reductions in fares on the lines of the Key System Transit Company, Oakland, Cal., which it is expected will cause a falling off in the company's revenue of about $400,000 a year; but the commission calculates that the change in the fares on the company's street car lines in Oakland, Berkeley and adjacent towns, will lead to an increase in business. The commission finds that the company ought to have an increase in net income of $1,000,000 a year; but believes that nearly half of this sum can be obtained through operating economies.

The fare from San Francisco to eastern termini of the road and vice versa, which includes a four-mile boat ride, has been reduced from 21 cents to 20 cents but the monthly commutation rate has been increased from $5.20 to $6. A new form of monthly ticket is to be sold at $5.50, good only on week days.

The street car lines are treated as a system separate from the trains running to and from the ferry terminus, and the territory is divided into a central and an outer zone. The fare, which heretofore has been seven cents, is to be reduced in each zone to five cents; but between 9 a. m. and 4:30 p. m., the five cent fare will be in effect between all points inside the larger area; and also in this same area, a weekly pass, good for bearer for an unlimited number of rides, is to be sold for one dollar.

The commission hopes that this will encourage people to give up their automobiles and ride on the street cars. The commission also advises the company to improve its service in certain respects. The reduction from seven cents to five cents in the rate is expected to affect 70 per cent of the riders; 18 per cent of the riders probably will make use of the weekly ticket and ride for less than five cents a trip, while 12 per cent of the present travelers are expected to take 10-cent rides.

Lake Cargo Coal Rate Hearings

The first part of the hearing before Commissioners Campbell and McManamy of the Interstate Commerce Commission on the reduction of 20 cents per ton in lake cargo coal rates proposed by the railroads serving the southern coal fields, to meet a similar reduction ordered by the commission from the Pennsylvania and Ohio fields, was concluded at Washington on November 22 and an adjournment was taken to Minneapolis for further hearings beginning on November 29.

After the southern roads had introduced testimony to show that the proposed rates would give them a revenue of approximately 5 mills per ton mile and that this would more than cover the out-of-pocket cost of transporting the coal, while they would lose a large share of the traffic unless the reduction from the northern fields was met, a large number of southern coal operators testified in support of the reduction. They said that without a reduction corresponding to that ordered by the commission they would lose a large share of their lake trade and that this would seriously handicap their general operations because the lake business enables them to operate during the summer months. Operators from the Ohio and Pennsylvania districts also appeared in opposition to the reduction, saying it would be put them back where they were before the commission's last order.

Several times during the hearing counsel for the coal operators insisted that the northern railroads state their position. On the last day of the hearing several witnesses representing the northern lines were put on the stand to testify to exhibits illustrating the effect of the commission's reduction and of the proposed reduction, but W. N. King, general attorney of the New York Central, said that they were not appearing as protestants. He proposed that the situation be met by a restoration of the situation as it was before the commission's reduction of last summer and counsel for the Norfolk & Western and Louisville & Nashville said they would be willing, but W. S. Bronson, representing the Chesapeake & Ohio, said he did not know that he could agree to such a proposal.

The witnesses for the northern roads testified that the effect of the commission's reduction from Pennsylvania and Ohio was to reduce their revenues by about $1,326,000 a year, and that the proposed reductions would reduce their revenues as participating carriers by $1,626,000 a year. Exhibits were also introduced to show that the net income of the northern roads has recently been declining while that of the roads serving the southern fields has been increasing, and rate exhibits were produced to show that the proposed reductions, if allowed, would seriously disturb the coal rate structure generally.

Ernest Ballard, representing the Ohio coal operators, told the commissioners that the protestants were seeking an order similar to that issued by the commission in which the Detroit, Toledo & Ironton a few years ago was not allowed to put into effect a reduction in coal rates, on the ground that it would cause discrimination and disturb the rate structure. The commission in the lake cargo decision declined to find that the rates which it ordered reduced were prejudicial, on the ground that the railroads serving the competitive districts are not the same, but held that they were unreasonable.

Governor Christianson of Minnesota asked the commission to cancel its suspension of the rates proposed by the southern roads, taking the position that the commission was interfering with a "voluntary" proposal of the southern roads to share their "abundant prosperity" with the consumers of the Northwest.

Equipment and Supplies

Locomotives

THE TORONTO, HAMILTON & BUFFALO is inquiring for 2 Mikado type locomotives.

THE GULF, MOBILE & NORTHERN has ordered 2 Pacific type locomotives, from the Baldwin Locomotive Works.

THE ST. LOUIS & OHIO RIVER (Aluminum Company of America) has ordered 1 Mikado type locomotive, from the American Locomotive Company.

Freight Cars

THE LOUISVILLE & NASHVILLE will issue inquiries within the next few days for 2,250 freight cars and 16 passenger cars.

THE ARGENTINE STATE RAILWAYS are inquiring, through the car builders, for 100 flat cars, 75 gondola cars and 25 box cars, all of 30 tons' capacity.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for 3,850 freight cars including 1,000 box cars, 500 gondola cars, 500 refrigerator cars, 300 flat cars, 500 automobile cars, 250 double deck stock cars, 500 single deck stock cars, 100 Rodger ballast cars, 100 caboose cars and 100 air pump cars.

Passenger Cars

THE TEXAS & PACIFIC contemplates buying a number of passenger cars in the near future.

THE LONG ISLAND is inquiring for 10 baggage cars and 2 combination baggage and mail cars.

THE HUDSON & MANHATTAN has ordered 20 subway cars, from the American Car & Foundry Company.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for 76 passenger cars including 18 coaches, 20 chair cars, 10 three-compartment coach and smoking cars, 10 baggage cars, 10 baggage and mail cars, all to be 70 ft. long, 3 mail cars, 60 ft. long, 3 parlor cars, 1 coach, smoking and baggage car and 1 business car.

THE NEW YORK RAPID TRANSIT COMPANY (Brooklyn - Manhattan Transit) has ordered 50 triplex units, made up of 150 car bodies mounted on 200 trucks, four trucks to each unit, from the Pressed Steel Car Company, of the same type as those ordered previously from the same builder. Inquiry for this equipment was reported in the *Railway Age* of March 5.

Iron and Steel

THE MISSOURI PACIFIC is inquiring for 37,950 tons of rail.

THE TEXAS & PACIFIC is inquiring for 14,400 tons of rail.

THE NEW YORK CENTRAL has ordered 400 tons of steel for six bridges.

THE INTERNATIONAL GREAT NORTHERN is inquiring for 10,000 tons of rail.

THE PENNSYLVANIA is inquiring for 1,000 tons of steel for transmission towers.

THE DELAWARE, LACKAWANNA & WESTERN is inquiring for 17,000 tons of rail.

THE UNION PACIFIC is inquiring for 900 tons of structural steel for a viaduct at Seattle, Wash.

THE WABASH has ordered 9,500 tons of rail from the Illinois Steel Company; 7,500 tons from the Inland Steel Company and 3,000 tons from the Bethlehem Steel Company.

Machinery and Tools

THE CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA, has ordered a four spindle mud ring drill from the Niles-Bement-Pond Company.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS has ordered a 36-in. to 44-in. side head boring mill, from the Niles-Bement-Pond Company.

Signaling

THE ILLINOIS CENTRAL has ordered from the Union Switch & Signal Company, automatic train stop apparatus for 26 locomotives which are to be used on the line between Champaign, Ill., and Branch Junction.

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company, an electro-mechanical interlocking for SF tower, Indianapolis, Ind.; 12 mechanical levers and 13 electric; also a smaller machine for Rose Lake, Ill.

THE PHILADELPHIA RAPID TRANSIT COMPANY has ordered from the Union Switch & Signal Company, an electro-pneumatic interlocking for Allegheny Avenue station on the Frankford elevated division; eight working levers including four for traffic-locking between adjacent towers.

THE NEW YORK CENTRAL has ordered from the General Railway Signal Company, an electric interlocking for Sixteenth and Clark streets, Chicago; Model 2, unit lever type, 48 levers. This is an addition to the 152-lever G. R. S. machine which has been in service at that point since 1901.

THE LEHIGH VALLEY has contracted with the General Railway Signal Company for the installation of an electric interlocking plant at Musconetcong Tunnel, N. J.; 80 levers, Model 2. The signals will be position-light. The extreme east and west limits of this plant are about two miles apart, the middle portion including the tunnel, 5,000 ft. long.

Supply Trade

Andrew H. McDougall, has been elected vice-president and director of sales of the **Whiting Corporation,** Harvey, Ill. Mr. McDougall was graduated from Michigan University with an M. E. degree in 1901; during 1900 he served as a machinist with the E. D. Smith Company on the Michigan-Lake Superior power canal project, Sault Ste. Marie, Ontario; also as a machinist for

A. H. McDougall

the Allis-Chalmers Mfg. Co., Milwaukee. From 1901 to 1903 he was a designer of special wood and iron working machinery for the Studebaker Brothers Manufacturing Company, South Bend, Ind. In 1903 he went as a designer to the Whiting Foundry Equipment Co. (now the Whiting Corporation), Harvey, Ill., and subsequently served successively as estimator, chief draftsman, chief engineer, vice-president and consulting engineer, and now becomes vice-president and director of sales, for the Whiting Corporation.

The Parsons Company, Newton, Iowa, has prepared plans for a one-story addition to its plant to cost $20,000.

The Morgan Engineering Company, Alliance, Ohio, has opened an office at 150 Broadway, New York. **E. J. Parker** is in charge.

J. J. Hennessy has opened an office at 136 Liberty street, New York City Mr. Hennessy manufactures and distributes Hennessy journal lubricators.

A. D. Carriger, sales manager of the pump and tank division of the **Wayne Company,** Fort Wayne, Ind., has been promoted to vice-president and director of sales for all plant divisions and will be succeeded by **W. L. Kennedy,** assistant to the sales manager.

Fred J. Fisher of Fisher Brothers, Detroit, Mich., **Clarence R. Bitting,** also of Fisher Brothers, and **Arthur W. Cutten** of Chicago, have been elected directors of the **Baldwin Locomotive Works.** Thomas G. Ashton resigned as a director and was succeeded by his son-in-law, **Joseph Neff Ewing** of Philadelphia. This increases the number of directors on the board from 12 to 15 members.

Alfred L. Carlson recently joined the **Giddings & Lewis Machine Tool Co.,** Fond du Lac, Wis., as sales engineer, with headquarters in New York City, to take care of the eastern territories. Mr. Carlson was formerly connected with the Gisholt Machine Company, Madison, Wis., the Otis Elevator Company, New York, and the Henry Prentiss Company, New York.

Locomotive Shipments in October

October shipments of railroad locomotives, from principal manufacturing plants, based on reports received by the Department of Commerce, totaled 110 locomotives, as compared with 127 in September and 151 in October, 1926. The following table gives the shipments and unfilled orders of locomotives for each month since January, 1926:

Year and Month	Shipments					Unfilled orders, end of month				
	Total	Domestic		Foreign		Total	Domestic		Foreign	
		Steam	Electric	Steam	Electric		Steam	Electric	Steam	Electric
1926										
January	126	91	11	22	2	653	506	53	52	42
February	163	101	22	38	2	572	442	60	30	40
March	162	146	11	4	1	780	635	50	54	41
April	151	122	12	1	16	713	580	44	60	29
May	140	105	14	12	9	726	585	46	72	23
June	159	133	11	12	3	667	522	53	72	20
July	132	82	20	30	..	555	445	36	51	23
August	124	78	16	23	7	525	455	26	28	16
September	134	109	13	5	7	498	386	24	77	11
October	151	124	15	12	..	390	286	20	71	13
Total (10 mos.)	1,442	1,091	145	159	47	....	....	..	..	..
November	128	109	15	3	1	517	391	27	84	15
December	185	152	17	5	11	398	297	14	79	8
Total (year)	1,755	1,352	117	167	59	....	....	..	..	..
1927										
January	57	16	8	31	2	412	334	23	49	6
February	80	69	10	..	1	403	314	29	51	9
March	137	84	11	42	..	392	301	55	27	9
April	98	72	23	3	..	334	255	42	27	10
May	109	77	15	13	4	434	380	34	7	13
June	89	63	18	8	..	400	333	31	26	10
July	60	35	18	7	..	399	299	57	24	19
Auust	81	71	6	4	..	363	244	68	30	21
September	127	86	7	28	6	271	167	49	40	15
October	110	81	10	10	9	180	97	43	32	8
Total (10 mos.)	948	654	126	146	22	....	....	..	..	..

The Burden Iron Company, Troy, N. Y., has opened a New England sales office in the Statler office building, Park Square, Boston, Mass. **Charles S. Clark** is district sales manager.

The properties of the **Standard Underground Cable Company,** Pittsburgh, Pa., have been acquired and its current obligations assumed by the **General Cable Corporation** (formerly Safety Cable Company) which has also acquired the properties and assumed the current obligations of the Rome Wire Company, the Dudlo Manufacturing Corporation, the Baltimore Sheet & Wire Company, and the Phillips Wire Company. There will be no change in the personnel of the management which will continue the business of Standard Underground Cable Company as a division of the General Cable Corporation.

Obituary

George W. Torrence, manager of the Chicago office of the Pittsburgh Testing Laboratory, died suddenly on November 16 at his home.

Harry Barnard, mechanical superintendent of the **Union Draft Gear Company,** Chicago, died on November 17, following an extended illness.

Alonzo G. Kinyon, consulting engineer with the Fuller Lehigh Company, Fullerton, Pa., died on November 13 at Johns Hopkins Hospital, Baltimore, Md., following an operation. He was born at Amboy, Ill., in 1870, and early in his career became associated with railway work. During the time he was connected with the railways he was identified with development in the fuel burning equipment and fuel conservation with different railway companies. In 1915 Mr. Kinyon turned his attention to pulverized fuel, joining a company connected with the use of pulverized coal on locomotives, and in September, 1918, became associated with the Fuller Lehigh Company with which he continued until his death. Mr. Kinyon was the inventor of the Fuller-Kinyon conveying system for transporting pulverized material.

Trade Publications

MULTI-TRACK ASH PLANTS—The Ogle Construction Company, Chicago, has issued a folder containing a drawing, in blueprint form, of the multiple track ash plants built by that company. It also displays photographs of several installations accompanied by descriptive matter.

ROLLER BEARINGS FOR RAILROAD JOURNAL BOXES.—Concise statements, in the form of questions and answers, outlining the salient engineering facts regarding Hyatt equipped railroad journal boxes, are contained in a bulletin just issued by the Hyatt Roller Bearing Company, Newark, N. J. Sectional views show the details of this equipment.

Construction

ALABAMA & WESTERN FLORIDA.—This road has applied to the Interstate Commerce Commission for permission to extend its line 12½ miles from Chipley, to Graceville, Fla. The new extension is planned to serve a lime crushing plant and a saw mill in the territory reached.

ATCHISON, TOPEKA & SANTA FE.—This company reached an agreement on November 18 with authorities of Oklahoma City, Okla., for the construction of a new passenger station and elevation of its line through the city. Location of the station will be on or adjacent to the site of the present station.

BALTIMORE & OHIO.—This road has let a contract to J. E. Nelson & Sons, Chicago, Ill., for the construction of water treating plants at Defiance, Ohio, and Syracuse, Ind., at a total of about $18,000. It has also let a contract to the Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa., for the installation of a water supply system at Yoder, Pa., at a cost of about $12,000.

CANADIAN NATIONAL.—A contract for the construction of a 100-ton mechanical coaling dock at Turtleford, Sask., has been awarded to the Claydon Company, Ltd., Winnipeg, Man. A contract for the construction of a brick freight shed and office at Melfort, Sask., has been let to Wilson & Wilson, Regina, Sask.

CHICAGO, ROCK ISLAND & PACIFIC.—Under a tentative agreement between this company, the St. Louis-San Francisco and authorities of Oklahoma City, Okla., which is subject to the approval of the Interstate Commerce Commission, a new passenger station to serve these two railroads will be constructed in that city on the right of way of the Frisco south of the business section. At the same time the Rock Island agrees to remove its tracks and facilities from their present location in the business district contingent upon the popular approval on November 29 of a $4,000,000 bond issue. The proceeds from the sale of the bonds will be used to purchase the present Rock Island right of way and passenger terminal property. The agreement was reached at a hearing held at Oklahoma City before J. B. Keeler, Interstate Commerce Commission examiner, on November 17.

HUDSON BAY.—Construction of a branch of this railroad from the Pas Man northwest to the Flin Flon mining area in northern Manitoba, 85 miles, will be undertaken by McLean & Tomlinson, Winnipeg, Man., following the agreement of the Manitoba Provincial Government to make payments up to $100,000 annually for five years to guard against operating losses and the decision of the Whitney mining interests to contribute $250,000 to the work. Preliminary surveys have been completed and the location survey is now under way. The agreement with the contractor provides that the project must be completed within one year and estimates the cost of the entire line at $3,500,000. When completed the branch will be operated by the Canadian National.

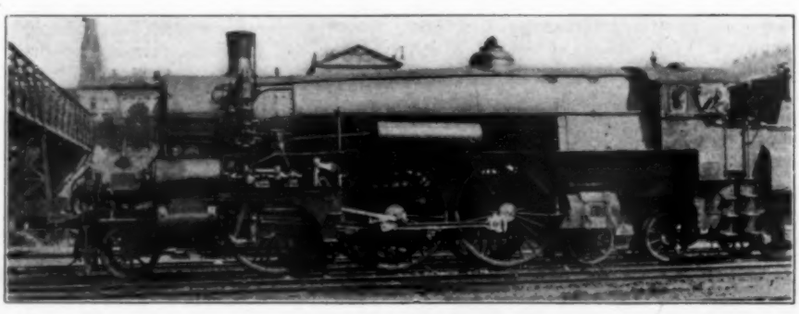
READING.—This company is preparing plans for the electrification of its suburban lines at Philadelphia and it is expected work will be begun on the Chestnut Hill branch early in 1928, to be completed in about two years. The electrification of lines to Glenside and the one to Langhorne will, it is expected, follow. It is estimated the cost of electrifying the Chestnut Hill branch will be somewhere near $5,000,000 which includes the expense of eliminating a number of grade crossings.

SOUTHERN.—This road is considering the construction of a new brick freight station at Greensboro, N. C.

SOUTHERN PACIFIC.—This company and the Great Northern have jointly purchased 7.5 acres of land at Klamath Falls, Ore., for the construction of a freight terminal in the near future.

TEXAS-NEW MEXICO.—This company, of which G. O. Bateman of Breckenridge, Tex., is president, has applied to the Interstate Commerce Commission for authority to build a line from Monahans through Kermit, Tex., to a point on the Texas-New Mexico state line, about 35 miles.

VANCOUVER HARBOR BOARD.—Authorization has been received for the construction of a railroad subway under Lonsdale Avenue, Vancouver, B. C., to connect the Harbor Board terminal railway with the Pacific Great Eastern. It is expected that the cost of the work will be more than $150,000.



Rudolf Kreutzer

On the Austrian Federal Railways

Railway Finance

ALABAMA GREAT SOUTHERN. — *Note Authorized.*—The Interstate Commerce Commission has authorized this company to issue a promissory note for $5,200,000 and to procure authentication and delivery of $5,206,000 first consolidated mortgage 4 per cent bonds, series B, to be held in the treasury subject to further order. The proceeds of the note will be used to meet the maturity on December 1, 1927, of $1,749,000 first mortgage bonds and £711,500 general mortgage bonds, equivalent at $4.86 per pound sterling to $3,457,890, making a total of $5,206,890. The company proposes to sell the bonds on or about February 1, 1928, notes being issued in the interim in the hope that the gross revenues for the year 1927 will exceed $10,000,000 in which case the bonds will become a regular investment for savings banks.

BALTIMORE & OHIO.—*New Director.*—Bernard M. Baruch of New York has been elected a director to fill the vacancy on the board occasioned by the death of R. Brent Keyser.

BOSTON, REVERE BEACH & LYNN.—*Control Sold.*—Karl Adams, president of this company and owner of over 5,000 shares of the total of 8,500 shares outstanding, has advised other stockholders that he has sold his shares and is retiring from control and management of the company. The stock has been sold at a price of $137.50 a share to a voluntary association called the Eastern Railway Association of which Charles F. Weed, George W. Treat and Samuel Hoar are trustees. A provision was included in the terms of the sale that the minority stockholders would have the right to receive the same price for their stocks should they desire to sell. This company operates a narrow gage line between East Boston and Lynn, with a branch to Winthrop, Mass.

CANADIAN NORTHERN. — *Income Debenture Redemption.*—English holders of Canadian Northern 5 per cent income charge debentures unanimously decided last week at a meeting in London to accept the offer of the Canadian government to redeem them at 94 per cent. Sir Gilbert Garnsey, chairman of the London Committee representing the stockholders, told the meeting that any other course than acceptance would involve years of investigation and litigation, with perhaps doubtful issue. The settlement, he said, would help to improve Canadian credit on the London market. The Canadian Ministers of Finance and Railways, Sir Gilbert said, had promised to introduce at the next session of the Parliament at Ottawa legislation making the settlement effective. He paid tribute to the reasonable way in which the Dominion government and Canadian National Railways had met the stockholders' committee during the whole period of negotiation. The amount of the debentures outstanding is approximately $25,000,000 and no interest has been paid upon them since 1914, during which time they have been the subject of continuous controversy, and this controversy has been regarded as detrimental to Canadian credit among British investors. The debentures become payable at par in May, 1930, but under the present agreement they are to be in May, 1928, at 94 per cent.

CHICAGO & NORTH WESTERN.—*Equipment Trusts Sold.*—This company has sold to Salomon Brothers & Hutzler, subject to the approval of the Interstate Commerce Commission, an issue of $2,610,000 equipment trust 4½ per cent notes, series S, to be dated October 1, 1927, and due serially $174,000 each year from October 1, 1928, to 1942, inclusive, at 101.32 and interest.

DETROIT & IRONTON.—*Bonds.* — This company has applied to the Interstate Commerce Commission for an extension of time to December 31, 1929, in which to issue $7,500,000 of first mortgage 5 per cent gold bonds, previously authorized by the commission. The commission has granted an extension of time for the completion of work on the construction of the company's extensions.

DULUTH, SOUTH SHORE & ATLANTIC. —*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its Republic branch, from Humboldt, Mich., to Republic, 8.7 miles, which was built to serve mining operations now abandoned.

GULF, MOBILE & NORTHERN.—*Payment on Preferred Dividend Accumulations.*—Directors have declared a dividend of $2.50 on the preferred stock payable January 3 to stockholders of record December 15. Of this payment $1.50 will represent the regular quarterly payment and $1 is to be applied to the accumulated unpaid dividends of $17.50, reducing that item to $16.50. A year ago the amount of preferred dividends in arrears was reduced from $20.

MISSOURI - ILLINOIS. — *Stock Dividend Authorized.* — The Interstate Commerce Commission has authorized this company to issue $750,000 capital stock to be distributed to stockholders as a dividend. The company's capitalization at present consists of $1,500,000 capital stock and no funded debt.

MISSOURI PACIFIC.—*Bonds.*—The Missouri Pacific Corporation in Nebraska has applied to the Interstate Commerce Commission for authority to issue $2,276,500 of first mortgage 5 per cent bonds to be delivered to the Missouri Pacific, which owns its stock, in reimbursement for advances.

MISSOURI PACIFIC.—*Dividend Arrearages.*—It is unofficially reported that the special committee recently chosen to make a study of the possibilities of taking care of the unpaid accumulations of Missouri Pacific preferred dividends, will recommend to the executive committee that the preferred stock be put on its regular $5 dividend basis soon after the beginning of 1928 and that an extra disbursement amounting to $2.50 a share annually be paid towards clearing up the arrears on the preferred stock which at the end of 1927 will amount to about $47.50 a share. It is further stated that the plan is a temporary one, pending plans looking for the consolidation of the extensive controlled properties.

POTATO CREEK. — *Abandonment.* — A certificate has been issued by the Interstate Commerce Commission authorizing this company to abandon its railroad which extends from Betula to a connection with the Pennsylvania at Hamlin Station, McKean County, Pa.

TEXAS & PACIFIC.—*Bonds.*—The Interstate Commerce Commission has issued a supplemental report authorizing this company to procure the authentication and delivery of $14,000,000 of general and refunding mortgage 5 per cent gold bonds, of which $7,000,000 are to be pledged as collateral for short term notes and the balance to be held in the treasury.

TONAPAH & GOLDFIELD.—*Abandonment.* —The Interstate Commerce Commission has issued a certificate authorizing this company to abandon a track known as the cutoff, between Main Line Junction and McSweeney Junction, 6.75 miles, in Esmeralda County, Nev. Evidence was given that there was no business to warrant the existence of the cutoff, traffic being routed via Tonapah.

ULSTER & DELAWARE. — *Bondholders Protective Committee.*—Holders of Ulster & Delaware first consolidated mortgage 5 per cent gold bonds outstanding in the amount of $2,000,000 and maturing on June 1, 1928, are asked by a committee of which F. J. Lisman is chairman, to make prompt deposit of their bonds with the Central Union Trust Company of New York, as depository, for the proper protection of the interests of the bonders.

"It is anticipated," says the committee, "that the railroad company will not be able to make payment of said bonds at maturity. Accordingly, united action on the part of the holders of said bonds is deemed essential for the protection of their interests, and the undersigned, at the request of holders of a substantial amount of the bonds, have consented to act as a committee for the protection of the interests of the holders of said first consolidated mortgage 5 per cent gold bonds under the terms of a deposit agreement dated November 10, 1927, a signed copy of which has been filed with the depositary."

Other members of the committee are Arthur M. Collens, vice-president of the Phoenix Mutual Life Insurance Company, Hartford, and William G. Edinburg, treasurer of the Potter Transportation Company, New York; Allan B. Lane, 20 Exchange Place, New York, is secretary; Cook, Nathan & Lehman are counsel.

WABASH.—*Suit for Dividends.*—A suit has been filed in the Federal Court of New York to restrain this company from paying dividends on its Class B preferred stock and its common stock until alleged overdue payments of $693,330 dividends on Class A preferred stock have been paid.

The suit is brought by John C. Barclay, Montclair, N. J., a stockholder, and names as defendants in addition to the railway company, the brokerage houses of Myron S. Hall & Co., and C. D. Halsey & Co. and Earl Krapp, described as a railway executive.

According to the complaint, it is admitted that the Class "A" stock is not cumulative. It is guaranteed a dividend of $5 a year, however, subject only to the company's earning enough money for operating expenses and for the payment on the Class "A" stock. It is contended that from 1915 until January, 1917, when no dividends were paid, and from then until April, 1918, when dividends were paid at the rate of 4 per cent, and from then until May, 1925, when no dividends were paid, the company's earnings were at all times sufficient for the full payment of dividends on such stock.

William Fraser Dickson of New York, a large holder of Wabash stock, has announced that he has retained attorneys to interevene as a party defendant in the suit brought by Mr. Barclay.

WESTERN PACIFIC.—*Increase in Capital Stock Proposed.*—The Western Pacific Railroad Company is reported to be planning to increase its capital stock from 75 million to 100 million dollars, the purpose of the change being to bring the share capital of the company more into line with that of the Western Pacific Railroad Corporation which holds the stock of the operating company.

Average Price of Stocks and of Bonds

	Nov. 22	Last week	Last year
Average price of 20 representative railway stocks..	120.93	120.64	101.59
Average price of 20 representative railway bonds..	97.10	96.89	91.95

Valuation Reports

The Interstate Commerce Commission has issued final valuation reports finding the final value for rate-making purposes of the property owned and used for common-carrier purposes as follows:

Pittsburgh & Ohio Valley.....	$153,000	1919
Santa Maria Valley.....	220,000	1916
Great Southern	678,660	1916

Dividends Declared

Atlantic Coast Line.—Common, 3½ per cent, semi-annually; extra, $1.50, both payable January 10, 1928, to holders of record December 15.

Cincinnati, New Orleans & Texas Pacific.—Preferred, 1¼ per cent, quarterly, payable December 1 to holders of record November 21.

Consolidated Railroads of Cuba.—6 per cent cumulative preferred, 1½ per cent, quarterly, payable January 3, 1928, to holders of record December 10.

Cuba Railroad.—Common, $1.20, quarterly, payable December 28 to holders of record December 28.

Delaware & Bound Brook.—2 per cent, quarterly, payable November 21 to holders of record November 16.

Illinois Central, leased lines.—2 per cent, payable Jan. 2, 1928, to holders of record Dec. 13

Midland Valley.—Preferred, $1.25, payable December 1 to holders of record November 23.

New York, New Haven & Hartford.—7 per cent preferred, $1.75 (initial) quarterly, payable January 2, 1928, to holders of record December 5.

Railway Officers

Financial, Legal and Accounting

T. W. Matthews, assistant secretary and assistant treasurer of the Seaboard Air Line, with headquarters at Portsmouth, Va., has been elected treasurer, with the same headquarters. **W. F. Cummings** has been elected assistant secretary, with headquarters at New York.

F. L. Nellis, assistant secretary and assistant treasurer of the Seaboard Air Line, with headquarters at New York, has been elected secretary, with the same headquarters. Mr. Nellis was born in Montgomery county, New York, in 1889. He attended the Nelliston Public School and the Fort Plain High School in that county, which he supplemented by private studies. In 1909, upon being graduated from the Eastman Business School of Poughkeepsie, N. Y., he entered the service of the New York, New Haven & Hartford in its traffic department at the old Grand Central station in New York. Subsequently Mr. Nellis accepted a civil service appointment in the office of the clerk of Queens county,

F. L. Nellis

New York, which position he resigned in 1915 to enter the service of the Seaboard Air Line in the executive offices at New York. In 1918 he was elected assistant secretary of this company and shortly after was elected an assistant treasurer, positions which he was holding at the time of his recent election as secretary.

R. P. Jones, assistant to the vice-president—accounting of the Seaboard Air Line, with headquarters at Baltimore, Md., has been elected comptroller. Mr. Jones was born on April 20, 1892, at Norfolk, Va., and attended grammar school and business college. He entered railway service in 1907, as an office boy in the engineering department of the Virginian. During 1909 and 1910 he was employed by the Southern successively as collector, baggage master, freight receiver and assistant cashier at Norfolk and Portsmouth, Va. In 1910 he entered the service of the Seaboard Air Line and served successively in various capacities, among

R. P. Jones

which were assistant general bookkeeper, special accountant and principal assistant to the corporate comptroller (during federal control). He became assistant general auditor on March 1, 1920, and assistant to the vice-president in November, 1922, which position he was holding at the time of his recent election as comptroller. From September, 1917, until January, 1919, Mr. Jones was employed as cost accountant in the Ordnance Department, serving in the capacity of assistant supervisor and supervisor and during the latter part of this period was in charge of the Pittsburgh district cost accounting branch.

Operating

A. B. Hillman, roadmaster on the Belt Railway of Chicago, with headquarters at Clearing, Ill., has been appointed assistant trainmaster with headquarters at the same point.

J. F. Deasy, chief of freight transportation of the Pennsylvania, with headquarters at Philadelphia, Pa., has been appointed to a similar position on the Long Island, with the same headquarters.

R. K. Rochester, assistant general manager of the Eastern region of the Pennsylvania, with headquarters at New York, has been appointed general manager of the Long Island, with the same headquarters. A photograph and biographical sketch of Mr. Rochester's railroad career, appeared in the *Railway Age* of June 18, 1927, page 1983.

Carl Bucholtz, assistant general manager of the Western district of the Erie, with headquarters at Youngstown, O.,

has been appointed general manager of that district, with the same headquarters, succeeding **H. J. Klein,** resigned. **H. R. Adams,** superintendent of the Kent division of the Western district at Marion, O., has been appointed assistant general manager at Youngstown, O., to succeed Mr. Bucholtz. **H. T. Kinney,** superintendent of the Wyoming division of the Eastern district and the Wilkes-Barre & Eastern (Erie), with headquarters at Dunmore, Pa., has been transferred to Marion, O., succeeding Mr. Adams, and will in turn be succeeded by **Harold R. Cole,** now transportation inspector of the Eastern district at Hornell, N. Y.

Traffic

J. F. Herrington has been appointed general agent of the New York Central at Los Angeles, Cal.

W. M. Powers has been appointed traffic manager of the Alton & Eastern and the Litchfield & Madison, with headquarters at St. Louis, Mo.

W. E. Craddock, live stock agent on the New York, Chicago, St. Louis at Indianapolis, Ind., has been transferred to Chicago and his jurisdiction has been extended to cover the entire Nickel Plate system.

J. A. Fitzpatrick, freight traffic manager of the New York, Chicago & St. Louis, with headquarters at Cleveland, O., has been appointed general freight traffic manager, with the same headquarters.

Charles E. Dempsey has been appointed assistant general traffic manager of the Pittsburgh & West Virginia and the West Side Belt, with headquarters at Pittsburgh, Pa., succeeding **Charles Yon,** resigned.

F. D. Claggett, assistant to vice-president of the Southern, with headquarters at Washington, D. C., has been appointed freight traffic manager, with the same headquarters. He will be in charge of freight traffic matters in the east, in New England and the state of Virginia.

Wills J. Carter, division freight and passenger agent of the Southern Pacific lines in Texas at Harlingen, Tex., has been promoted to assistant general freight and passenger agent, with headquarters at the same point. **M. L. Love,** agent at Nacogdoches, Tex., has been promoted to general agent at Brownsville, Tex., representing both the operating and traffic departments.

T. C. Thomas, traffic agent of the Chicago Great Western at Winnipeg, Man., has been promoted to general agent, with headquarters at the same point, succeeding **Charles A. Fullen,** who has been appointed assistant general agent at Portland, Ore. **J. A. Walden,** traffic agent at San Francisco, Cal., has been promoted to assistant general agent, with headquarters at the same point.

Maggie Glover, auditor of the Pecos Valley Southern, with headquarters at Pecos, Tex., has in addition been appointed general freight and passenger agent and assistant secretary. **C. Schoenfelder, Jr.,** general freight agent of the Texas & Pacific, with headquarters at Dallas, Tex., has also been appointed assistant general freight and passenger agent of the P. V. S.

E. F. Flinn, general freight agent of the Grand Trunk Western, with headquarters at Chicago, has been appointed freight traffic manager, with headquarters at the same point, succeeding **R. L. Burnap,** promoted. **James Cameron,** assistant general freight agent, with headquarters at Chicago, has been appointed general freight agent, with headquarters in the same city, succeeding Mr. Flinn.

Ralph H. Wallace, passenger traffic manager of the Erie, with headquarters at New York, who, at his own request, has been relieved from active duty after 53 years of service, effective December 1, was born on August 31, 1858, at Zanesville, O., and was educated in the public schools. He entered railway service on March 1, 1875, as station agent on the Erie at Geneva, Pa., which position he held until November 1, 1880, when he was appointed station agent at Lakewood, N. Y. On October 1, 1882, Mr. Wallace was appointed to a similar position at Atlantic, Pa. From March 1, 1887, until March 1, 1892, he was ticket agent at Oil City, Pa., and then became traveling passenger agent

R. H. Wallace

at Akron, O., being transferred in the same capacity to Youngstown, O., in 1894. From May 1, 1896 until March 1, 1902, he was general agent in the passenger department at Cleveland, O., and then became assistant general passenger agent, which position he held until January 14, 1905. At that time Mr. Wallace was appointed general passenger agent at New York, continuing in this capacity until April 17, 1918, all this service being with the Erie. From April 18, 1918, until February 29, 1920, Mr. Wallace was a member of the passenger traffic committee, Eastern territory, United States Railroad Administration, and on March 1, 1920, became passenger traffic manager of the Erie, which position he has since held. In 1912 and 1913 Mr. Wallace was president of the Passenger Traffic Officers' Association and in 1913 and 1914 was president of the New York Traffic Club.

Frederick O. Stafford, freight traffic manager of the New York Central, with headquarters at Chicago, has been promoted to assistant traffic manager, with headquarters at the same point. **J. P. Patterson,** assistant freight traffic manager of the lines west of Buffalo, N. Y., and the Ohio Central lines, with headquarters at Chicago, has been promoted to succeed Mr. Stafford. A photograph and biographical sketch of Mr. Stafford's railway experience appeared in the *Railway Age* of December 11, 1926, page 1194, at the time of his promotion to freight traffic manager. Mr. Patterson's previous railway experience was reviewed in a biographical sketch which appeared with a photograph in the *Railway Age* of January 22, 1927, page 322, at the time of his promotion to assistant freight traffic manager.

Harrell R. Wilson, who has been promoted to general freight agent of the Missouri Pacific, with headquarters at Little Rock, Ark., was born on November 23, 1886, at Bolivar, Tenn. After graduating from high school he entered railroad service in 1905 with the Illinois Central. Mr. Wilson occupied a number of minor positions on this railroad and in 1916 he was appointed general freight and passenger agent of the Mississippi Central, with headquarters at Hattiesburg, Miss. In 1920 Mr. Wilson was advanced to traffic manager, leaving the Mississippi Central in 1924 to become assistant general freight agent of the Missouri Pacific at St. Louis in charge of lumber, cotton and cotton seed products traffic. He served as assistant general freight agent at St. Louis until his promotion to general freight agent at Little Rock on November 1.

Mechanical

Charles James, who has been appointed superintendent of motive power of the Erie, with headquarters at New York, was born on October 7, 1866. He entered the service of the Erie on December 19, 1890, as a machinist at Huntington, Ind., and remained in this position until February 28, 1891. From March 1, 1891, until November 30, 1900, he was successively roundhouse foreman, engine dispatcher and gang foreman at Huntington, Ind. He then became general foreman at Chicago, a position he held until September 30, 1902. From this time until September 30, 1906, Mr. James held the position of general foreman successively at Huntington, Ind., Hornell, N. Y., and Port Jervis, N. Y. At the latter time he was appointed master mechanic at Avon, N. Y., and served in that capacity successively at the following places until August 31, 1914, Galion, O., Port Jervis, N. Y., and Jersey City, N. J. At

the latter time he was appointed mechanical superintendent, lines West, serving in this capacity at Youngstown and Cleveland, O., until February 29, 1920. He served in that position on the Hornell region at Hornell, N. Y., until September 30, 1920, on the Ohio region at Youngstown, O., from October 1, 1920, until February 28, 1921, on the Ohio and Chicago regions at Youngstown from the latter time until February 28, 1922. At this time he was granted a leave of absence. He returned to the Erie on November 16, 1922, serving again as mechanical superintendent on the Ohio region at Youngstown, O. On February 16, 1927, he was transferred in the same capacity to the Eastern district at Hornell, N. Y., which position he was holding at the time of his recent appointment as superintendent of motive power.

Charles James

Charles M. House, who has been promoted to superintendent of motive power and equipment of the Chicago & Alton, with headquarters at Bloomington, Ill., received his first instruction in the construction of rolling stock as a carpenter and a blacksmith with the American Car & Foundry Company at St. Charles, Mo. Mr. House was later promoted to a position in the engineering department. Prior to his connection with the Alton in 1918 he was employed in the engineering department of the Danville Car Company and in the mechanical department of the Union Pacific at Omaha, Neb. In 1918 Mr. House was appointed chief draftsman in the mechanical department of the Alton at Bloomington, becoming general car foreman, with headquarters at the same point in 1920, a position he held continuously until his promotion to superintendent of motive power and equipment on October 20.

C. M. House

F. W. Hankins, chief of motive power of the Pennsylvania, with headquarters at Philadelphia, Pa., has been appointed to a similar position on the Long Island, with the same headquarters.

Grant W. Stanton, traveling engineer of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., has been appointed master mechanic of the Winnipeg division, with headquarters at Thief River Falls, Minn., succeeding **Arthur L. Fillmore,** deceased.

Special

E. C. Schmidt has been appointed manager of the news bureau of the Union Pacific with headquarters at Los Angeles, Cal.

Obituary

Charles R. Hosmer, at one time manager of telegraph service on the Canadian Pacific, and at the time of his death, a director of that railroad, died on November 14 at his home in Montreal, Que., at the age of 76 years.

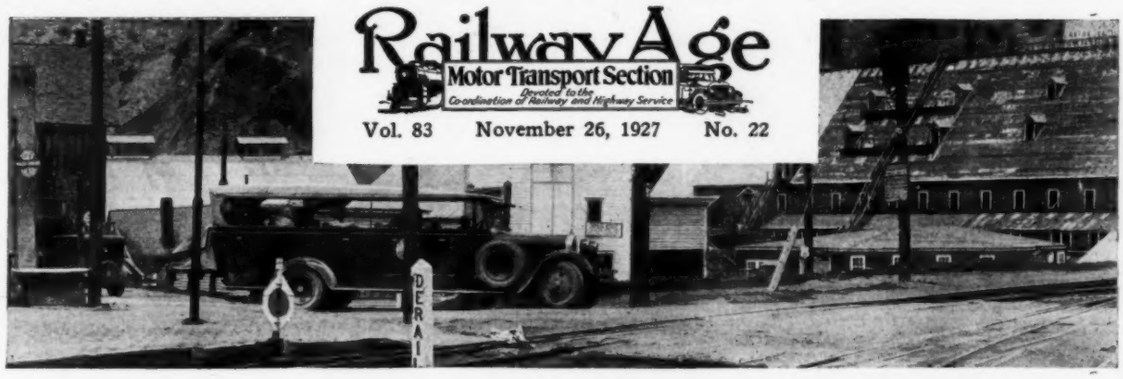
A. W. Woodruff, general superintendent of the Northern district of the Union Pacific, with headquarters at Cheyenne, Wyo., from March, 1920, to April, 1925, died at Denver, Colo., on November 17. Lately Mr. Woodruff had been engaged in business in Denver. He had been connected with the U. P. since his first entry into railway service as a call boy. In 1912 Mr. Woodruff was promoted to assistant superintendent at Cheyenne, later being transferred to North Platte, Neb., and then to Ogden, Utah, where he remained until July, 1917, when he was promoted to superintendent, with headquarters at Cheyenne. During the World War Mr. Woodruff served in France and attained the rank of major, receiving a citation for meritorious service at Bassens.

Benjamin Howell Griswold, formerly general traffic manager of the Western Maryland, died on November 17 at Baltimore, Md., following an attack of pneumonia. Mr. Griswold was born on October 3, 1845, at St. Louis, Mo., and was graduated from Trinity College at Hartford, Conn., in 1866. He entered railway service as a civil engineer in 1867. From 1871 until 1872 he was operator and chief clerk of the Baltimore & Ohio, at Hagerstown, Md., and from 1872 until 1874 was agent for the Western Maryland at the same place. From 1874 until 1883 he served successively as auditor and general freight and ticket agent, becoming general freight and passenger agent at the latter time. From 1902 until 1906, Mr. Griswold was general traffic manager of the same road, and from 1903 until 1906 was also general traffic manager of the West Virginia Central & Pittsburgh, which is now a part of the Western Maryland.

CHARLES SANGER MELLEN

Charles Sanger Mellen, formerly president of the New York, New Haven & Hartford, the Boston & Maine and several other railroads, died at his home in Concord, N. H., on November 17. He had been ill for several years, but death was due to cerebral hemorrhage. Mr. Mellen was born on August 16, 1851, at Lowell, Mass., and entered railway service on September 22, 1869, and until March 1, 1872, was a clerk in the cashier's office of the Northern New Hampshire (now part of the Boston & Maine). From March, 1872, until January, 1873, he was clerk to the chief engineer of the Central Vermont at St. Albans, Vt., from the latter date until October 1, 1880, served on the Northern New Hampshire in the following capacities: For three months as superintendent's clerk and for seven years five months as cashier, chief clerk and assistant treasurer. On that date he became assistant to the manager of the Boston & Lowell (now part of the Boston & Maine), which position he held until January 1, 1881. From October 1, 1881, until March 1, 1883, Mr. Mellen was auditor of the Boston & Lowell and the Concord (also a part of the Boston & Maine) and then became superintendent, remaining in that position until June 1, 1884, when he was appointed general superintendent. This position he held until June 1, 1888, and then was appointed general purchasing agent of the Union Pacific system, remaining in this position until November 1 of the same year. From that date until March 1, 1889, Mr. Mellen served as assistant general manager, and as general traffic manager from March 1, 1889, until April, 1892. He then became general manager of the New York & New England (now part of the New York, New Haven & Hartford) at Boston, Mass., and on October 27 of the same year was appointed second vice-president of the New York, New Haven & Hartford, which position he held until September 1, 1897. From that date until October 23, 1903, Mr. Mellen was president of the Northern Pacific, and from November 1, 1903, until July, 1913, was president of the New York, New Haven & Hartford. From October, 1910, until July, 1913, he was also president of the Boston & Maine. He was also for several years until July, 1913, president of the Central New England, the Maine Central and the New York, Ontario & Western and vice-president of the Rutland. Mr. Mellen retired in July, 1913.

Railway Age
Motor Transport Section
Devoted to the Co-ordination of Railway and Highway Service
Vol. 83 November 26, 1927 No. 22



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Nothing has ever been built that even approaches this six cylinder bus in important exclusive features and popular appeal.
PERFORMANCE COUNTS

Railway Age
Motor Transport Section
Devoted to the Co-ordination of Railway and Highway Service

Vol. 83, No. 22 November 26, 1927
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Growing Public Resentment Against "Fly-By-Night" Buses

WITHIN the past few weeks the authorities of two midwestern states have announced their determination to do something to curb the activities of certain "fly-by-night" bus lines which are operating in their states, but which escape the jurisdiction of the state regulatory commissions by reason of their being interstate operators. The passage of federal legislation providing for the regulation of interstate bus lines should prove to have the same salutary effect on the "fly-by-night" interstate operators that the fairly general passage of state regulatory laws and their administration have had upon intrastate bus operators of the same kind. The passage of such federal legislation, however, is still in the future, and in the meantime the abuses of some of the unregulated interstate operators are arousing public indignation and official determination on the part of state authorities to stop them. Under the law, state authorities cannot regulate buses operating in interstate service, but the police laws of the states can prevent the continuance of practices of some of the interstate operators which endanger the safety of the public. Such infractions of the law as speeding and crossing railway lines without stopping endanger the public, and the state authorities are determined to end them. Similarly, the state authorities are determined to prevent the interstate buses, which do not comply with state laws, from carrying intrastate passengers, as is frequently done. The results of such law enforcement will be beneficial to all concerned.

Motor Coach Luxury Nearing Its Limit

IT seems probable that the time is close at hand, if not already here, when the interior appointments of motor buses cannot be made more luxurious. This welcome state of affairs should be an important factor in stabilizing the business of motor coach transportation since it should eliminate the factor of obsolescence from a passenger comfort standpoint in the depreciation of the equipment. In the early days of motor bus development, and in fact up to a very short time ago, thousands of buses were bought and put in service, only to have to be withdrawn long before the time of their mechanical wearing out due to their inability to attract traffic in the face of the competition, of other motor buses which were no better mechanically but which had passenger accommodations of later design and consequently greater luxury. It was inevitable that motor buses could not go on getting more and more luxurious every year. A limit had to be reached and apparently it has now been reached, or at least will be very soon. It would be not at all surprising if a reaction sets in from the craze for totally unwarranted luxury, evidences of which have been frequently noticed. However that may be, motor bus operators can now approach the purchase of current models with confidence that next year's motor buses will not relegate them to the scrap heap on account of any comparative crudity of their provisions for the comfort of their passengers. From a mechanical standpoint, the ultimate in refinement of motor bus design has not been reached and it is not considered likely that it will ever be. Mechanical improvements in the equipment are constantly being made and they will continue to be made as experience in operation indicates the necessity for them. As a general rule, however, these new refinements will not have the effect of rendering earlier models obsolete, at least from the standpoint of their ability to attract the patronage of the public.

Spread of Organized Truck Lines Should Not Be Ignored

FREQUENT notice has been taken of the tendency toward the stabilization of the motor bus transportation business through the consolidation of numerous small weak lines into larger systems of proportionately greater financial strength. A similar trend of somewhat less striking, but nevertheless substantial, proportions, is apparent in the case of the independent motor truck tranportation companies. The benefits to be derived from the organization of inter-city motor truck lines on an extensive scale with financial resources adequate to insure capable management and widespread traffic solicitation are just as great, if not greater, than the benefits to be derived through the consolidation into one large system of numerous small bus lines. This fact is being demonstrated by the growing number of independent motor trucking companies which are not satisfied with having one line between two cities, but which are extending their lines to many cities on numerous routes and organizing their operations on a system basis. The system of motor truck lines placed in operation by the Murphy Transfer & Storage Company of Minneapolis, Minn., which is described on another page of this issue, is a case in point. The truck

lines of the Murphy Company extend to virtually all parts of the territory surrounding the Twin Cities, like the spokes of a wheel. Having organized this operation on such a large scale, the company is able to do a business which supports a traffic solicitation force of corresponding size, which in turn brings to the trucks of the company a proportionately increased business. Similar large, resourceful motor trucking companies are to be found in other parts of the country and their number is increasing rapidly. If the railways have felt the effect of the competition of small disorganized truck operators, they may expect to feel even more the competition of these large, organized truck system operators.

The Intangible Advantages Of Motor Truck Operation

SOME of the advantages to be obtained through the operation of motor trucks by the railways for the transportation of l. c. l. freight within terminals and between local points on their lines, as developed by the experience of the railways which have pioneered in motor truck operation, are sufficiently tangible to enable the officers in charge to say, "We have eliminated so many trains, costing so much, and are doing the work now with so many trucks, costing so much less—the difference between them is a saving in operating expenses due to the replacement." Other advantages which have developed are intangible and incapable of such definition. The operation of motor trucks in replacement of train service for the handling of l. c. l. freight usually releases a certain number of cars for other service. It is obvious that there is an advantage here, but it cannot be stated in terms of so many dollars of savings. This is because the value of the cars released is an intangible thing, varying according to conditions which fluctuate from day to day. Similarly, motor trucks generally enable considerably quicker delivery than is possible in the case of delivery by train. In attempting to arrive at the exact dollars and cents value of motor truck operation, what value is to be ascribed to improved service? There is unquestionably a value there but one cannot place a finger on a certain amount and say, "This is it." These and others are intangible advantages which are being gained by the railways engaging in motor truck operation. It is more than likely that they are greater in value than the tangible advantages. Therefore, it is unusually worthy of notice when one of the intangible advantages of motor truck operation takes definite form. Recently the business being handled in a certain eastern locality was declining and the traffic handled in and out of that locality by all of the railways serving it was showing a steady decrease. One railway instituted motor truck service in this locality and it is doing more business there now than ever before and its traffic is increasing steadily, while that of the other railways continues to decrease. The railway which increased its business through motor truck operation had already been sold on the advantages of this form of transportation, but it is now even more thoroughly convinced of the benefits of truck operation than it was before.

The Motor Transport Division, A. R. A.

ALMOST a year ago the Railroad Motor Transport Conference in session at Chicago voted to petition the American Railway Association for inclusion in the association. On November 17 the member roads of the association approved a resolution setting up a separate Motor Transport Division of the A. R. A. It would be difficult to overestimate the importance of this action from the standpoint of those railroads which are in any way interested in motor transport and most of them are, indirectly if not directly.

The attitude of railroads toward the motor vehicle both as an ally and as a competitor needs further discussion and clarification. The subject of interstate motor vehicle regulation is growing in importance with the prospect of some early legislation and the railroads need to have their side of the question discussed and considered. These are problems which the new division can well take up at an early stage in its career.

Since the Railroad Motor Transport Conference was initiated, at the June convention in Atlantic City in 1926, the reasons for the formation of such a group, valid then, have become even stronger. The use of motor vehicles by agencies outside the railroad field grows each month as does the utilization of these vehicles by the railroads themselves.

There is need of a greater degree of co-operation between the railroads and the motor industry itself. That greater progress has not been made on this score is largely due to the absence of a group, familiar with automotive problems, which could represent the railroad point of view in discussions of co-operative action. The resolution setting up the Motor Transport Division specifically mentions the securing of this co-operative action as one of the purposes for which the division was created.

Finally, there is what may be one day the most important activity of the division, the collection and dissemination of scientific information concerning the railroads' own experiences with motor transport. Railroad officers charged with motor vehicle operation need to see their colleagues from other railroads frequently —to profit from reports of their successes and failures. The Motor Transport Division should provide a valuable clearing house in this field and should learn, and widely disseminate among all the railroads, information as to situations in which railroads can with profit utilize the motor vehicle.

The division has a difficult and important task ahead of it and, consequently, we hope that it may be organized and set to work as soon as possible. The Railroad Motor Transport Conference, the forerunner of the new division, in the few months of its existence set an enviable precedent for earnest and effective work which the division itself will beyond doubt follow.

The work of the new division, impinging as it will on practically every other department of the railroad, will be followed with great interest by all railroad men. We extend our felicitations to the Motor Transport Division and wish for it an active and valuable career in the service of the railroads.

Exterior View of Pennsylvania Bus with "Railroad Special" Body

Pennsylvania Begins Operation of Third Bus Line

Contract provides for three round trips daily between Olean, N. Y., and Bradford, Pa.

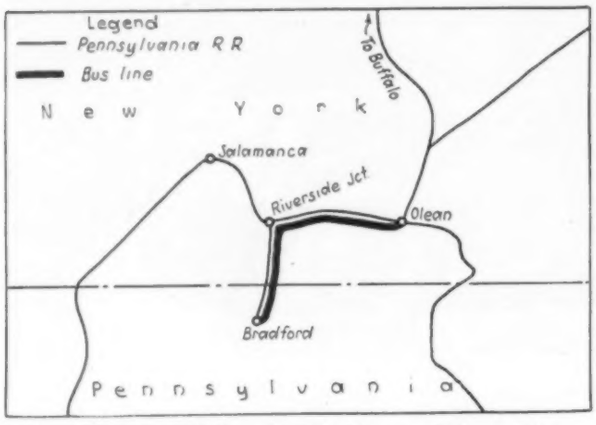
THE Pennsylvania, which already had two short bus lines in operation supplementing and replacing train service on two branch lines, has recently installed its third bus operation. This one extends from Olean, N. Y., via Riverside Junction, to Bradford, Pa., a distance of approximately 22 miles. The operation is carried on for the Pennsylvania under contract by the O. B. & S. Bus Line, Inc., the headquarters of which are at Olean, N. Y. The O. B. & S. Bus Line is a subsidiary of the Olean, Bradford & Salamanca, an electric railway which abandoned operation of its trains several months ago. The O. B. & S. Bus Line continues to operate several trips per day on its own account in addition to those which it operates for the Pennsylvania. A total of 132 bus-miles are operated daily on Pennsylvania service, and 136 bus-miles daily in its own service.

Under the old schedule of train operation, the Pennsylvania operated two trains in each direction daily between Olean and Bradford, two additional trains in each direction daily between Olean and Riverside Junction, and one additional round trip train between Bradford and Riverside Junction. Since the inauguration of bus service one additional run in each direction between Olean and Bradford has been installed, this being a bus schedule leaving Olean at 6:30 p. m. and arriving at Bradford at 7:35 p. m., and on the return trip, leaving Bradford at 9:20 p. m. and arriving at Olean at 10:20 p. m. The other bus schedules call for the bus to leave Olean at 5:35 a. m. and 11:15 a. m., arriving at Bradford at 6:35 a. m. and 12:20 p. m., respectively. In the opposite direction the bus leaves Bradford at 9:50 a. m. and 4:25 p. m., arriving at Olean at 10:55 a. m. and 5:30 p. m., respectively.

The two round trips daily between Olean and Riverside Junction are still made by steam trains, these being through trains operating to and from Oil City, Pa. The former steam train making the round trip between Bradford and Riverside Junction has been replaced by a bus schedule leaving Bradford at 7 a. m. and arriving at Riverside Junction at 7:27 a. m. The Pennsylvania is

Looking Forward Inside New Pennsylvania Bus

also continuing the operation of one round trip by steam train daily for the full distance from Olean to Bradford. This steam train schedule and the three bus schedules daily in each direction between Olean and Bradford give the territory between these points twice as frequent service as it had when only two round trips were made by steam train daily prior to the inauguration of the bus service. Regular tickets issued by the Pennsylvania are



Map Showing Relation of Bus Line to Railway Lines

honored on the bus between Bradford and Olean. In addition, in case passengers going from Bradford to points beyond Olean or Riverside Junction served by the bus schedules made on its own account by the O. B. & S. Bus Line, their tickets are honored for the entire distance, the same applying in the case of passengers from beyond Olean or Riverside Junction going to Bradford. Passengers of this sort are given a special ticket attached to their regular ticket which is lifted by the bus driver. The operation and maintenance of the bus is entirely taken care of by the O. B. & S. Bus Line organization. The company is reimbursed on a mileage basis for the schedules that it operates for the Pennsylvania. The Pennsylvania in turn receives all the revenue received on the bus when it is making the Pennsylvania schedules.

Bus Has Special Body

Only one bus is required to make the schedules operated for the Pennsylvania by the O. B. & S. Bus Line. This is a six-cylinder A. C. F. motor coach powered with a Hall-Scott engine. The body is a special type built by the Baker-Raulang Company, Cleveland, Ohio, to the specifications of the Pennsylvania. This type of body, which is called the "Railroad Special" coach body by the Baker-Raulang Company, was described in the *Motor Transport Section* of October 22, page 812.

The bus has a large baggage space in the rear with an extra wide door so that trunks, express and mail can be readily carried inside. The bus has seats for 21 passengers in addition to 4 extra seats in the baggage section at the rear. The seats, which are of the suburban type, are upholstered in genuine leather over air cushions and springs. Ventilation is provided by means of two cowl ventilators, two large ventilators over the windshield, and six roof ventilators. The interior is illuminated by three dome lights and 14 smaller lights which are attached beneath the patented Baker luggage lofts, which extend most of the length of the bus on each side. The floor is covered with linoleum and the roof height is 73 in. One bus somewhat similar to the bus described is maintained by the O. B. & S. Bus Line as reserve equipment.

A. R. A. Authorizes Motor Transport Division

THE member roads of the American Railway Association in session in New York on November 17 approved a resolution authorizing the establishment of a new division of the association, to be known as the Motor Transport Division.

The movement which has culminated in the formation of this division was instituted in Atlantic City in 1926 during the June conventions when a meeting of railroad officers interested in motor transport matters was held. A subsequent meeting was held in August, 1926, at Providence, R. I., and a temporary organization, the Railroad Motor Transport Conference, was organized. At a meeting in Chicago in December the conference voted to petition the American Railway Association for inclusion in that organization. The resolution as adopted by the member roads lays down the following rules for the division:

1. Their action and conclusion would be recommendatory only in all cases, as is the practice with the other divisions of the association;
2. That the number of, place and manner of meetings would be subject to the approval of the board of directors of the association;
3. That the membership would be confined entirely to representatives of railroads or their subsidiaries;
4. To bring about the greatest measure of cooperative action with the motor industry itself in any direction that may seem advisable;
5. The present forces of the association to handle all the secretarial and other work of the division, without any additional expenses of this nature;
6. The outside cost to the Association will be for stationery and printing, and estimated to cost not in excess of $3,000 per annum;
7. In view of the scope of this subject, embracing as it does all of the various phases of railway activity, it should be a separate division, under the name of the Motor Transport Division.

B. & M. Changes Seating Capacity Of Buses

THE seating capacity of its Yellow parlor-type motor buses, which are used on long runs, such as those from Boston to the White mountains, Boston to Portland and Concord, N. H., to Lake Sunapee, has been changed by the Boston & Maine Transportation Company from 20 passengers to 27 passengers. This type of Yellow coach ordinarily contains seats for 29 passengers, but when it placed its first order for them the Boston & Maine thought that larger seats were desirable and consequently had special chairs installed which allowed a seating capacity of 20.

The experience of two years of operation with these buses led to the conclusion that the small number of people who are uncomfortable in the smaller seats do not offset the loss of revenue which results from the cutting down of the capacity of the buses almost 33 per cent. The large seats, therefore, have been removed and smaller ones have been substituted, which give a capacity of 27 passengers with no seats over the wheel housing. The new seats are the latest model Heywood-Wakefield motor coach seats made of the finest reed with air cusions and the best springs.

Maintaining Baltimore & Ohio New York Coaches

The fleet is serviced by the Fifth Avenue Coach Company which uses the unit system of repairs

Part I

ON August 29, 1926, the Baltimore & Ohio transferred the operation of its passenger trains to the Jersey City terminal of the Central Railroad of New Jersey, from the Pennsylvania station at Thirty-third street and Seventh avenue, New York. At the time this change was made the railroad inaugurated the use of motor coaches to carry the passengers between the train side and various points in New York and Brooklyn.

At the present time 22 coaches are used for this service. These units are operated and maintained by the Fifth Avenue Coach Company, New York, which operates a fleet of over 500 buses in the city. This company has been operating motor buses since 1907, and during that period an unusually efficient system of maintenance has been developed using as a basis the unit system of repairs. The Baltimore & Ohio coaches are maintained under this system without any modifications whatever.

Five Operating Garages

The mechanical organization of the Fifth Avenue Coach Company is comprised, at present, of five mechanical operating garages, each caring for approximately 100 revenue and non-revenue vehicles. The personnel of these garages is under the direct supervision of the superintendent of rolling stock, who reports to the vice-president and general manager.

Under the superintendent of rolling stock are a general night foreman, and a day and a night mechanical foreman, each with an assistant, for each garage. These foremen and assistants cover 24 hours in 10 or 10½-hr. shifts as indicated in Table I.

Table I—Hours of Work of Supervisors

Day garage foreman	8:00 a.m.–6:00 p.m.
Day garage foreman's assistant	6:00 a.m.–4:30 p.m.
Night garage foreman	6:00 p.m.–4:30 a.m.
Night garage foreman's assistant	7:30 p.m.–6:00 a.m.

The mechanics in the equipment department are specialists and each mechanic, with an assistant, is responsible for the maintenance of a particular unit. A weekly check is kept on a personnel record sheet, which is reproduced in Fig. 1, showing the number of men that are employed, exclusive of the foremen and the assistants, and their hours of work.

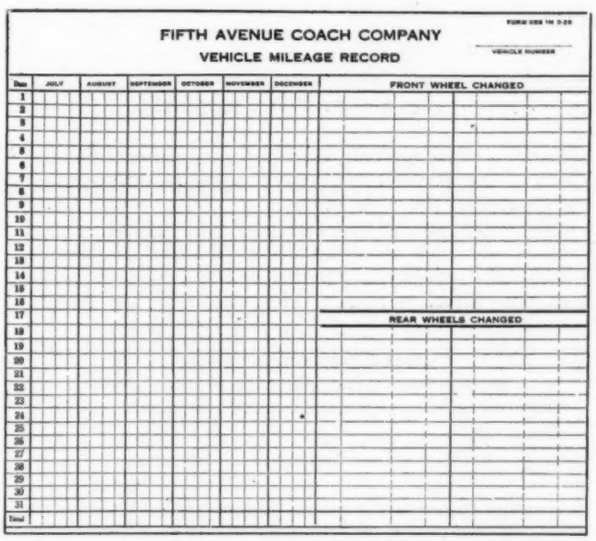


Fig. 2—Form for Recording Motor-Coach Mileage

In addition to the above-mentioned mechanical operating garages, there are two other separate departments;

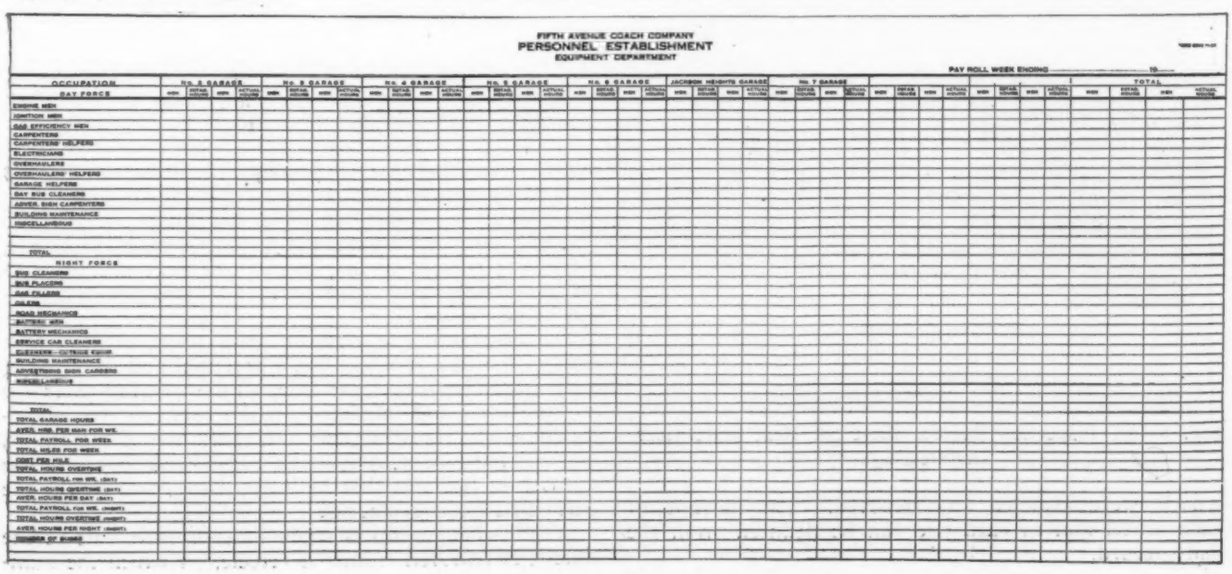


Fig. 1—Personnel Record Sheet

the annual-overhauling shop for the chassis and the body overhauling shop. In these shops, major repairs, in addition to the regular periodic overhauls, are made.

Mileage Records

For the sake of convenience, every vehicle has a number and every independent unit of each vehicle has a

EQP Form 6142

FIFTH AVENUE COACH CO.

UNIT CHANGE SLIP

Authority to change a_____

Division_____ Vehicle No._____ Date_____

No. of Unit Off_____	No. of Unit On_____
Removed by_____	Replaced by_____

CAUSE OF REMOVAL AND REMARKS

Foreman's Signature_____

This sheet must be turned into office immediately the change is made.

Fig. 3—The Unit Change Slip

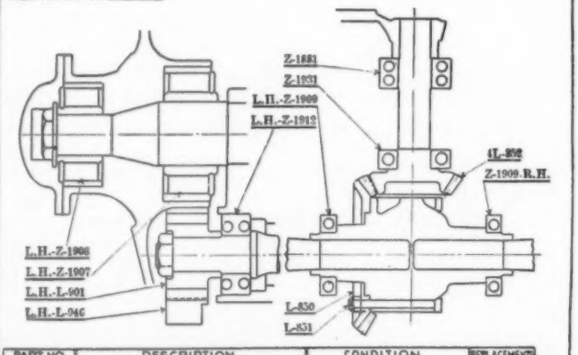
number. This applies particularly to the wheels and the tires. Tire records are linked with the mileage of the vehicle, and the tire records are also vehicle-mileage records and can be taken care of on the form shown in Fig. 2, on which are recorded the number of days in the month, the number of months of the year and the front- and rear-wheel numbers, with the dates on which the

FIFTH AVENUE COACH COMPANY

INSPECTION RECORD OF 4L TYPE REAR AXLE GEARS AND BEARINGS

REMOVED FROM BUS NO. ____ DIVISION ____ DATE ____ MILEAGE ____ UNIT NO. ____

MECHANIC'S NO. ____



PART NO.	DESCRIPTION	CONDITION	REPLACEMENTS
Z-1881	BEVEL DRIVE PINION AND SHAFT BEARING-OUTER		
Z-1907-L.H.	REAR WHEEL INNER BEARING		
Z-1911-R.H.	REAR WHEEL INNER BEARING		
Z-1908-L.H.	REAR WHEEL OUTER BEARING		
Z-1909-R.H.	REAR WHEEL OUTER BEARING		
Z-1906-L.H.	DIFFERENTIAL CASE BEARING		
Z-1909-R.H.	DIFFERENTIAL CASE BEARING		
Z-1912-L.H.	REAR AXLE DRIVE SHAFT BEARING		
Z-1912-R.H.	REAR AXLE DRIVE SHAFT BEARING		
Z-1931	BEVEL DRIVE PINION AND SHAFT BEARING-INNER		
L-901-L.H.	REAR AXLE DRIVE SHAFT PINION		
L-901-R.H.	REAR AXLE DRIVE SHAFT PINION		
L-946-L.H.	61 TOOTH INTERNAL GEAR RING		
L-946-R.H.	61 TOOTH INTERNAL GEAR RING		
L-1310	BEVEL DRIVE GEAR		
L-851	DIFFERENTIAL BOLT		
ML-1882	BEVEL DRIVE PINION AND SHAFT		

CAUSE OF FAILURE:

REMARKS.

DATE _____ INSPECTED BY _____

Fig. 4—An Inspection Record Sheet for Rear Axle Gears and Bearings

wheels were installed and removed. The mileage of each wheel and of each tire can be deduced from the daily record.

In keeping a proper record of these items, it is necessary that the person who removes a wheel from a motor coach shall make a record of it on the unit-change slip that is reproduced in Fig. 3. A tire-change slip is used for the reason that a different person removes the tire from the wheel at a different time from the removal of the wheel from the motor bus. A wheel may also be changed from one motor coach to another. These unit-change slips are sent to the mileage-clerk who transfers the information contained on them to the vehicle-mileage record, which might also be called a vehicle-mileage and tire record. No necessity has appeared for keeping a record of the mileage of inner tubes; consequently, the system explained will cover either pneumatic or solid tires.

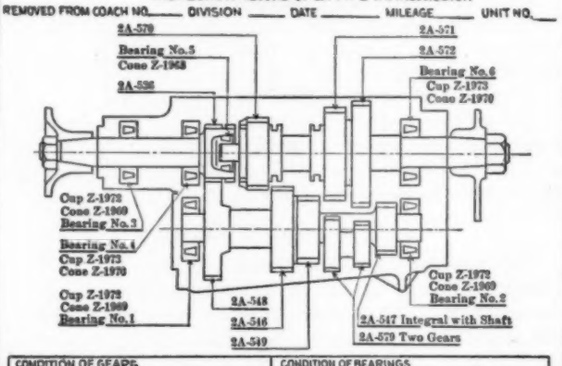
Maintenance of Parts

The cost of maintaining particular units of the vehicle is important and is obtained through the unit-change

FIFTH AVENUE COACH COMPANY

INSPECTION RECORD OF 2A TYPE TRANSMISSION

REMOVED FROM COACH NO.____ DIVISION ____ DATE ____ MILEAGE ____ UNIT NO.____



CONDITION OF GEARS	CONDITION OF BEARINGS
2A-536	1
2A-546	2
2A-547	3
2A-548	4
2A-549	5
2A-570	6
2A-571	
2A-572	
2A-579	

1 – CONDITION OF CASE
2 – AMOUNT OF END PLAY IN BOTTOM SHAFT
3 – AMOUNT OF END PLAY IN TRANSMISSION SHAFT (SPLINED) 2A-568
4 – WAS TRANSMISSION SHAFT PILOT BEARING TIGHT ON SHAFT?
5 – WERE CLUTCH LOCKING BEARING NUTS, PART A-539, TIGHT?
6 – WAS GEAR B TIGHT ON BOTTOM SHAFT?
7 – WAS GEAR D TIGHT ON BOTTOM SHAFT?
8 – WAS GEAR F TIGHT ON BOTTOM SHAFT?
9 – WAS PROPELLER SHAFT FLANGE, PART A-779, TIGHT ON SHAFT?

REMARKS.

DATE _____ INSPECTED BY _____

Fig. 5—Inspection Record Sheet for a Transmission

slips. The engines go to a definite location to be taken care of by specialists in engine repair work; the transmissions go to another specialist, the clutches to another, the rear axles, differentials and driving gears to others. Particular records of cost are kept in each of these specialized sections and a differentiation made between various makes of unit.

Diagrams are prepared of main units, such as the engine, the transmission, the differential and the driving gear assembly of the rear axle, all the wearing parts are so numbered and tabulated on the sketches that a mechanic, when repairing the unit, takes one of the sheets, two of which are reproduced in Figs. 4 and 5, records the number of the unit that he is repairing, and marks the parts that he is replacing.

A unit-change slip is made out for each unit at the time it is removed from the vehicle, on which the num-

ber of the motor coach and the date is given. A second change slip covers the installation of another unit to replace that removed.

By referring to the vehicle-mileage record, shown in Fig. 2, the mileage can be deduced for a particular unit, from the date of its installation to that of its removal.

FORM 023A

FIFTH AVENUE COACH COMPANY

STORES REQUISITION

DATE REQ. No.

ORDER NUMBER LOT NUMBER

QUANTITY PART NUMBER PRICE AMOUNT

NAME OF PART

WORKMAN'S NUMBER FOR DEPARTMENT

STOREROOM NUMBER FOREMAN'S SIGNATURE

STOREKEEPER FILLING REQUISITION | DATE ENTERED IN STORES LEDGER | ENTERED IN STORES LEDGER BY | ENTERED ON COST RECORD BY

ANALYSIS OF MATERIAL

CHASSIS
1. AXLE—FRONT
2. AXLE—REAR
3. BRAKE SYSTEM
4. CHASSIS—MISCELLANEOUS
5. CLUTCHES
6. ENGINES
7. EXHAUSTS
8. GASOLINE SYSTEMS
9. IGNITIONS
10. PROPELLER SHAFTS & UNIVERSALS
11. RADIATORS
12. SPRINGS—FRONT & REAR
13. STEERING GEARS
14. TRANSMISSIONS
15. WHEELS

LIGHTING SYSTEM
16. BATTERIES
17. GENERATORS & REGULATORS
18. LAMPS

BODIES
19. BAR & SHEET STEEL
20. BODIES—MISCELLANEOUS
21. FIRE EXTINGUISHERS
22. GLASS
23. HEAT SYSTEM
24. LUMBER
25. PAINT & VARNISH
26. SEATS

GENERAL
27. BUILDING & FIXTURES
28. CLEANING MATERIAL
29. EXPERIMENTAL
30. SERVICE CARS
31. SHOP EXPENSE
32. SHOP TOOLS & MACHINERY
33. SHOP EQUIPMENT & SUPPLIES
34. STATIONERY
35. TRANSPORTATION

Fig. 6—Material Requisition Form

In this way, the quality of the material acquired by the purchasing department, as well as the efficiency of the design, may be checked. If there is an isolated case in which an amount of trouble in excess of normal is shown on a particular unit, the trouble may sometimes be traced to the inefficiency of a driver. The feature of this system is that whatever may occur, the efficiency or the inefficiency can be attributed directly to its source. It may be caused by a poor driver, poor mechanical maintenance or poor material.

In the shops of the Fifth Avenue Coach Company, all

Fig. 7—Analysis of Material and Supplies Issued

material is obtained through requisitions, the form used being illustrated in Fig. 6. These requisitions are signed by the foreman, who notes in the column headed "analysis of material," the account to which the material should be charged, so that the full quantities can be allocated to the units and to the garages using it. The accumulated data for the month are summarized on the form shown in Fig. 7. In this manner, the cost of material and labor for operating maintenance can be computed from the data recorded on the analysis of material and supplies issued and the personnel establishment form, reproduced in Fig. 1.

Filling Stations

Each garage unit has at least two gasoline filling and oiling stations located at sufficient distances within the garage entrance to allow several motor coaches to enter at one time. The gasoline pumps have a capacity of at least 20 gal. per min. While the attendants are supplying gasoline, oil and water to the motor coaches, the driver, with the help of the assistant foreman of the garage, who is the official inspector, makes a general inspection of the motor coach, paying particular attention to the steering-gear and levers, the springs and the brakes. For this work the driver is paid. The result of the inspection, as well as any trouble experienced during the day's operation.

[The second and concluding part of this article will appear in the December 24 issue of the *Motor Transport Section*.—EDITOR.]

Jersey Central Contracts for Bus Service in New York

THE Central of New Jersey has arranged with the Gray Line Motor Tours, Inc. (a subsidiary of the Fifth Avenue Coach Company, New York) to operate a motor coach service between the railroad's terminal at Jersey City and the coach company's terminal at the Waldorf-Astoria Hotel, New York. Service will begin on December 5. Initial plans provide for operation on approximately 20-minute headway from both Jersey City and the Waldorf beginning around 7 a. m. and continuing until around 1 a. m. A fare of 25 cents will be charged for the one-way trip.

The railroad in August submitted to its patrons a questionnaire with the statement that some of its patrons had suggested that it arrange with a motor coach company to operate motor coaches between its Jersey City terminal and central Manhattan in both directions.

Over 80 per cent of the responses favored such a service and accordingly the railroad arranged with the Gray Line Motor Tours to provide it.

The equipment to be used will be of the de luxe type being manned by carefully chosen, uniformed drivers. While the exact route has not been decided, it will cross the Hudson on the railroad's Liberty street ferry and some longitudinal thoroughfare will be used to the mid-town district with the Gray Line-Waldorf Astoria terminal as the main up-town stopping point. It is expected that the coaches will also make a stop at Wanamaker's store at Broadway and Ninth street.

THE SUPREME COURT OF WEST VIRGINIA has refused the application of the independent bus operators for a rehearing of the case in which the State Road Commission was reversed and required to issue certificates for bus operation to the Baltimore & Ohio and an electric railway rather than to independent operators. The decision was reported in detail in *Motor Transport Section* of October 22. The only recourse open to the independents is an appeal to the United States Supreme Court and, if the state court wishes, it may grant a 90-day suspension of its judgment to allow this appeal to be taken.

Utilities Commissioners Discuss Motor Transport

Committee presents recommendations regarding regulation and taxation and summarizes railroad activity in field

A COMMITTEE of the National Association of Railroad and Public Utility Commissioners, headed by Amos A. Betts of the Arizona commission, presented a comprehensive report on motor vehicle transportation at the recent Dallas, Tex., convention of that association. An abstract of the report follows:

An eminent University authority has said that the conduct and administration of the highway systems of the country constitute the nation's greatest single experiment in public ownership and operation. As related to the motor vehicle in the public service, it is not, however, an entirely apt illustration, since there is a diversity of ownership—the highways by the public and the motor vehicle by private parties—which constitutes a bar to making this a true test of public ownership and operation. The public has an unquestioned right to the use of the highways for their personal use and convenience in moving from one point to another, whereas the operator of the motor vehicle in the public service is engaged in a business transaction from which he derives his livelihood. His is a privilege and not a right, and it is within the province of the state to say upon what terms and conditions he may carry on this business. The same principle applies with relation to the federal government in interstate commerce.

Hard surfaced and other improved highways have constituted an important factor in the rapid development of the motor vehicle in the public service. It is stated that in 1910 there were 200,000 miles of such roads within the United States, whereas in 1926 there were 557,000 miles in existence. Upon these highways there are now 80,000 passenger buses in service, a little more than one-third of which number are engaged exclusively in the handling of school children. Statistics show that there is one motor bus in the United States for every seven miles of improved highway, and that there are forty private cars for every mile of highway. We do not have the figures covering motor trucks, but it is well known that they are as firmly established as the bus, and that together they constitute a link in our transportation system as fixed and permanent as the rail lines. The big problem for regulatory authority is to see that so far as possible and practicable the two systems are coordinated and carried on in a manner that will result in the greatest good to the whole public. Indeed, it may be said that our present transportation system consists of three different units, namely: steam, motor and electric. For many years past there has been close co-operation between the steam and electric lines, the latter in many cases being operated as an adjunct to the former. It appears quite certain that the motor vehicle is destined to take an even more important place than that of the electric car or vehicle in connection with the operations of the steam roads.

The passenger bus has wholly supplanted the electric car in 65 cities and towns of 100,000 or less population. Its availability for cities of greater size where mass transportation becomes a problem, depends upon the ability of the manufacturers to increase carrying capacity comparable to that of the average street car.

As a complete substitute for electric service in cities in excess of 100,000 it has not thus far proven a success. Its real try-out in this respect has been in cities ranging in population from 100,000 to 200,000, and here even with the full sympathy and support of city authorities and the people, it is said to have been found wanting.

Regulation

Proper regulation of motor transportation is as vital to the operators as it is necessary in the public interest. The ease with which passenger carrying vehicles, or even the truck, might be acquired, furnished the incentive for the destructive competition which prevailed prior to legislation on the subject. That condition still obtains except as it has been changed by the necessity for larger and more costly vehicles.

Just as proper restrictions are desirable to prevent wasteful and uneconomical competition between the automobile and the rail carrier, it is even more essential between motor carriers themselves, if strong, dependable, financially responsible operators are to be maintained in the field for the benefit of the whole populace. The wild-catter, if permitted to do so, can, and indeed does disrupt and destroy the legitimate business of a lawful operator, and finally not even he has profited, since he usually reaches the end of his rope when his inferior equipment has been worn out.

How to reach and checkmate the wild-catter is a problem yet unsolved. Some commissions have quite effectively resorted to contempt proceedings, and where constitutional and statutory laws are adequate, this remedy would seem to be about the best method. Ultimately, and it is to be hoped that at no distant date, enforcement and peace officers will take cognizance of the violation of laws by this class of offenders to the same extent that they now do of other offences.

If regulation is to accomplish the best possible results, it appears to us that it should be all inclusive. By that, we mean that all classes of operations must come under the purview of the law if it is to be made really effective and prevent discrimination, both in the matter of rates and charges and as between the various operators. It is obvious that if the man operating between fixed termini and upon regular schedule, and who under these conditions must of necessity file tariffs and adhere thereto, is to be faced with the competition of unlicensed and unbridled operators who would take from him only the cream of the business paying the most profitable returns, that he will be in a very uncomfortable and perhaps even an unprofitable condition. In our opinion the man operating a taxi is performing a public service in exactly the same manner as the person operating a bus line between two points on a regular schedule. The nature of the transactions differs only in the length of the haul and the amount of the compensation. We think that the one

is as much subject to regulation as the other, and that if the hand of supervision is to be placed upon one it should also be laid upon both.

The opposition to regulation evidenced on the part of the public in its early stages has largely disappeared. The difficulty of securing co-operation and support from peace officers, so evident at first, has now almost vanished. The public has come to a realization of the benefits of proper regulation, and that realization is reflected in the activities of enforcement officers.

An Hiatus in Control

This committee is not charged with the duty of considering and discussing motor vehicle legislation since there is a special committee to which that subject has been assigned. We do not wish to encroach upon the prerogatives of that committee, but we will be pardoned, we hope, if we refer briefly to the subject because of its close relationship to and its effect upon operations. The Supreme Court decisions starting with the case of Buck vs. Kuykendall, 267 U. S. 307, and others handed down about the same time, seemed to shear the states of absolutely all power to supervise or regulate the activities of the operator engaged exclusively in interstate service. By many it was thought we were deprived of even the power to levy appropriate taxes for the maintenance of the highways, but fortunately the more recent decisions have clarified this point, and now within reasonable bounds we may force them to contribute something toward the damage which they do in their movement across the states. Without assuming to voice a criticism of the court, it seems to us regrettable that a way could not have been found whereby regulation of these instrumentalities of transportation might have been left with the states until Congress, by appropriate legislation, should take over the field. This is more especially true since up to this time at least the major volume of motor vehicle traffic is of intrastate character. Under present conditions we are confronted with a hiatus which no authority has the power to bridge. There are many reasons why federal regulation is desirable, not the least of which is that it would have a salutory effect upon "wild-catters" who have thus far been able to evade and escape the provisions of state statutes.

Now that the Supreme Court has settled the question of the right of the states to tax the interstate operator for road purposes, we think that it is desirable that so far as possible uniform legislation on this point should be adopted.

The gas tax which has become almost universal is, of course, the most popular form of taxation. It has the merit, or consistency at least, that, like the rain, it "falleth upon the just and the unjust alike." Without knowledge of the difficulties and expenses incident to the collection of taxes, we assume that perhaps the gas tax is accumulated with greater ease and perhaps less expense than other methods.

Danger in Overtaxation

In many of the states there is a specific tax of some kind or character placed upon the operator engaged in the public service and in view of the fact, as we have heretofore said, that he is using the highways as a privilege and not as a right, we think it is perfectly proper that there should be some additional tax over and above that paid by the person who operates his private car for purely personal reasons. We believe, however, that there is danger of carrying taxation in this respect beyond the bounds of reason.

The inability to accumulate accurate data over a considerable period of time reflecting the results of the operation of the motor vehicle in the public service is a rather serious handicap to regulatory authority in reaching scientific conclusions. The explanation of this is that apparently many operators have had little or no business training, and their volume of business is too small to warrant the expenses incident to the employment of skilled clerical forces. Another explanation is found in the fact that the federal government has not yet assumed supervision, and also that there has not always been helpful co-operation on the part of state and county peace officers in the strict enforcement of state laws, which, in the early stages of regulation were not always popular. Happily, the problem is gradually being worked out, and we think that we may look forward to its complete solution at an early date. Federal regulation, whose rules and requirements will be more rigidly adhered to, will go a long ways toward this end.

Just as there has been for some years past a tendency on the part of the owners of large electric, gas and water utilities, to absorb smaller plants, there is now a very noticeable movement on the part of the larger motor vehicle lines to take over the weaker units, and thereby strengthen the entire fabric. As this movement gains strength it will overcome the weaknesses incident to the unscientific and incomplete systems of accounting which have heretofore prevailed in many instances.

Another of the difficulties confronting proper regulation is the activity of the fellow engaged in so-called "private-contract" operations. Even some of those operating under permits between fixed termini and on regular schedules have asserted the right to handle this class of business. In our judgment the common carrier has no other service to offer except that reflected in his tariff filings, and we think it is best that he should be, and we think that finally he must be confined to the common carrier business.

It is, of course, much more difficult to determine the dividing line between the common carrier and the man engaged under private contract by motor vehicle than is the case with the steam railroad. Nevertheless we are of the opinion that there is little or no room for a twilight zone.

Insurance

The subject of insurance for the protection of passengers, and of bonds to guarantee the faithful performance of those engaged in the freight service is one which is not yet satisfactorily worked out. While passenger carrying vehicles have been covered by insurance in such manner as to safeguard the traveling public to a great extent, there is still much dissatisfaction concerning the premiums charged by the insurance companies. It is alleged that they are exorbitant and greatly in excess of what they should be, based upon losses sustained.

In many states it has been found almost impossible to secure bonds covering the operation of those engaged in the freight service. In some instances the insurance companies have declined to assume risks of this character under any circumstances; in others the rates have been so high as to be prohibitive. The demand for this measure of protection has been growing and some solution, therefore, must be found. Many of the operators are wholly irresponsible financially, and the loss of a shipment falls upon the shipper. In the matter of c. o. d. shipments there have been many instances of carelessness and indifference, approaching, if not actually reaching the point of embezzlement.

In only a few of the states is the administration of the insurance laws placed in the hands of the public service commission, and in a still smaller number is authority vested to regulate insurance rates. It would appear,

therefore, that this is a question in so for as the rates are concerned to be worked out between the operators and the insurance companies, but unless it is accomplished promptly, we think that the commissions would be justified in providing rules and regulations which will force action even to the extent of requiring cash bonds for the protection of the shipping public.

Facilities—Qualification of Drivers

A few, but apparently not many complaints have been registered concerning inadequate depot facilities. It is alleged that they are in some instances not supplied with suitable and comfortable seats, and that they are not kept in a clean and sanitary condition. We do not believe, however, that complaints of this kind can be laid at the door of the larger operators, but that they are confined in a large measure to those on short lines which have not sufficient financial backing.

It has frequently been urged that more attention should be given to the question of the qualification of drivers and that perhaps the commissions would be justified in requiring an examination before entrusting the lives of passengers to the hands of these employees. In view of the ever increasing size of passenger buses and the hazards incident to operations on roads where heavy grades and extreme curvature are encountered, we think that this subject is worthy of the most careful consideration.

Financial

Many of the motor vehicle lines have reached such proportions that financing to cover equipment and improvements has become a serious problem. It must be handled in much the same manner as other public service corporations, and in order that the best possible price for securities may be obtained, it is essential that franchises or certificates of convenience and necessity shall run for the longest practical and feasible period. Where a company's standing and record justify, a life of 10 years at least should be given. Short time certificates or franchises create an uncertainty which inevitably result in a greater discount when the securities are placed upon the market, and such discount must, of course, be met out of operating revenues and must, therefore, be paid by the traveling public.

Maximum Load Limit

This is a problem to be worked out and determined largely by the highway department of each state. Regulatory authority is interested only to the extent that excessive loading might create an unnecessary hazard to traffic, particularly in congested districts. Close co-operation between the highway departments and the state commissions will result in the greatest accomplishments in this respect.

Railroad Motor Transport Service

The report was concluded with a summary of recent activity of railroads in the field of highway transportation. Most of the instances cited have been reported in the *Motor Transport Section,* which was frequently quoted in the report.

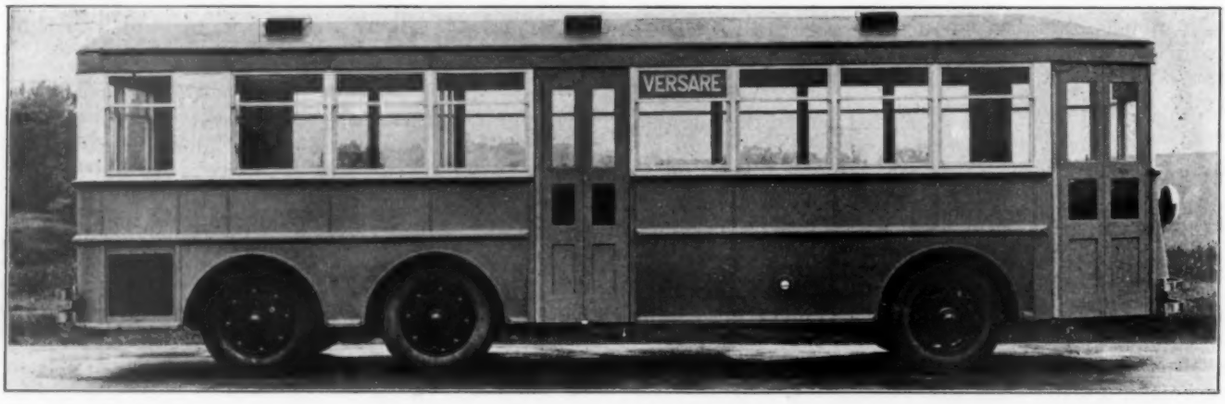
Regulation Discussed

Motor vehicle legislation was discussed by John E. Benton, general solicitor of the association, and S. A. Markle, Richmond, Va., chairman of the legislative committee of the American Automobile Association. Both speakers reviewed the efforts being made to secure a federal law empowering the Interstate Commerce Commission to regulate interstate highway common carriers but with the provision that the state commissions shall be delegated to serve as regional agencies for the federal commission.

Versare Six-Wheel Motor Coach

THE Versare Corporation, Albany, N. Y., has recently placed on the market a six-wheel motor coach that has a seating capacity of 35 and a standing capacity of 35. The coach weighs complete, 14,500 lb.

The gas-electric drive is through two standard Westinghouse traction-type 33-hp. motors mounted on the two rear axles. As each rear axle is driven by a separate electric motor, perfect differential action is given to all the wheels. The power plant is mounted at the extreme rear end of the body. It can be quickly removed and replaced without disturbing the radiators or fan units and without the use of an overhead crane. No oil or gas fumes can creep into the coach interior as all seams in the engine housing are effectively sealed.



The Versare Six-Wheel Coach

The body, which fits over the three pair of wheels and power plant, is designed according to railroad practice. The Duralumin bridge type of truss construction is used for rigidity. The Westinghouse air service brakes and mechanical emergency brake are used. The coach has a turning radius of 56 ft.

Insurance of Highway Carriers*

Great Risks and lack of uniform and adequate regulation make situation unsatisfactory

By Henry Swift Ives
Vice-President, Casualty Information Clearing House, Chicago

AT the present time one of the great problems confronting the stock casualty insurance companies is the matter of supplying liability insurance to motor vehicle common carriers of both passengers and freight at a price which will not only attract the business but which also will be adequate to furnish sound protection and efficient service. And the operators of motor vehicle common carriers also are confronted with the problem of obtaining sound insurance at a price which they think they can pay. The third party in this problem is the public represented by the various state railroad and utility commissions, it being the duty of these commissions to see to it that the public is protected, as far as dollars and cents will offer protection, against the damage to property or injury to persons which may result from the operation of these common carriers on the public highways.

In forty states these commissions have more or less general supervision of motor vehicle common carriers. Before the granting of a license to operate the carriers generally are required, either by statute or by commission order, or both, to satisfy the commission as to their financial responsibility within certain defined limitations for accidents which may result from their operations. This may be done by providing a liability insurance policy or a bond in the required amount, by the deposit of collateral or by a showing that the common carrier has sufficient financial strength to meet any likely demands for damages to its patrons or persons of the public or both.

The next step is for the motor vehicle operators to qualify under one or the other of these insurance requirements. There are a few companies which think they can indulge in the luxury of self-insurance, and these generally are controlled by steam or electric railway lines or by large public utilities which have sufficient reserves to meet any loss which may be foreseen. The great majority of operators, however, immediately discover that it is not the easiest thing in the world for them to obtain the required liability policy or bond in a strong company able to meet its obligations at all times at a price which they think they can afford to pay. As a result there is much complaint against the insurance business in general, the companies writing these lines often are called greedy and arbitrary and are accused of being members of a gigantic trust formed for the purpose of exacting an oppressive toll from the public. After shopping about a bit the complaining operator usually succeeds in getting some bargain counter insurance in a precariously solvent company which has no right to assume the heavy obligations imposed by this particularly hazardous form of insurance protection.

The denouement often comes when a bus is wrecked, several passengers killed and many injured and the accumulated claims swamp the insurance carrier. The state commission then is blamed for permitting an unsound insurance company to carry such a risk and the institution of insurance generally is raked fore and aft by an undiscriminating public opinion.

Reasons for High Rates

It is true that many of the larger stock casualty companies backed by sufficient reserves and equipped with proper service facilities to handle motor vehicle common carrier liability insurance are very shy about writing this kind of business. Some of them will not touch it at all. Others write it only in special cases and in connection with other lines. A few write it quite generally but only under the most careful supervision and inspection. The rates charged in any event usually are considered extraordinarily high by the buyers and hardly high enough by the insurance company. It must be admitted, however, that from a dollars and cents viewpoint and without any particular reference to the risks assumed by the company, the rates are high and often undoubtedly impose quite a serious, and often times almost confiscatory, tax on the bus and freight line operators—all of which, however, is not at all the fault of the insurance companies.

The immediate problem before us is how sound liability insurance protection may be made available at a price sufficiently low so as not to work a hardship on the operators of motor vehicle common carriers and at the same time at a price which will permit insurance underwriters to engage in such undertakings with the expectation of being able to provide sound protection and efficient service at a reasonable profit. In no other manner, indeed, can business adjustments of this character be effected with entire satisfaction to all concerned. No one is more anxious than the insurance companies to see such a result obtained, and some of the most distinguished casualty underwriters in the world have been working to find the key to this situation for a long time. Indeed, if they could today find a way to cut the prevailing bus and truck rates in half and still maintain the solvency of the companies they represent I assure you that they would jump at the chance to make such a recommendation. Unfortunately, however, they are not in a position to put into effect or to enforce any of the suggestions they may have along these lines and can only hope for the active and hearty co-operation of the motor vehicle common carriers and the state railroad and utilities commissioners, the two other important factors in the present situation. And I firmly believe that through such frank co-operation many of the present difficulties which confront the insurance underwriters will be wiped out and that the business of providing adequate liability insurance protection for motor vehicle common carriers will become as stabilized as is ordinary automobile liability insurance.

Difficulties to Be Overcome

There are two outstanding difficulties which must be overcome, however, before such a result is obtained, and both of them are for the most part within the regulatory authority of the state railroad and utilities commissioners. They are:

First—Reduction of accidents through safety measures.

*Abstract of address delivered at convention of National Association of Railroad and Utilities Commissioners, Dallas, Texas, October 20.

Second—Simplification, clarification and uniformity of insurance regulations.

There can be little hope, in my opinion, of any material reduction in the cost of liability insurance until there is a decided reduction in the present accident frequency due to the operation of motor vehicle common carriers upon the public highways. The insurance companies do not make the rates. These are made by the assured, and as long as the accident toll is heavy the insurance toll will be high. That is axiomatic. Several bus lines operated by steam or electric railways during the last year have made admirable accident prevention records, and the same is true of a few scattered so-called independent companies. Even as to these, however, there is much room for improvement, and for the general average of independent operators there isn't much to be said except that they have a mighty hard time getting even poor insurance at a high rate.

High Speed and Other Factors

Any one at all familiar with passenger buses knows that many of them run at high rates of speed. How, indeed, can a bus operator expect an insurance company to protect him at a low cost, or at any cost, against the tremendous potential risk assumed when a crowded bus goes thundering and dodging along often congested and usually too narrow public highways at express train speed? Would any one of you be willing to underwrite such a risk at what a bus operator would call a reasonable figure? I think not.

Unfortunately there are no figures available to clearly demonstrate the extra-hazardous nature of bus insurance. I have seen some data collated by the National Safety Council and the American Automobile Association as to deaths due to bus operations. These, however, are meaningless for the purposes of this discussion not only because of their localized and fragmentary nature but also because the percentages are figured from the number of the various types of motor vehicles involved in accidents and not from their mileage. The best evidence that I know anything about that the bus and truck accident frequency is high is the fact that even under existing rates the insurance of this kind of public transportation has been far from profitabale or desirable from the standpoint of the leading stock casualty companies.

In this connection it also must be remembered that a large percentage of accident claims are for comparatively minor personal injuries or for property damage, and many of these never get into the accident statistics. They, however, entail a very large expense for investigation and the like by insurance companies, and lawyers' fees and medical service are no small part of the total. In one case with which I am familiar, a bus line operating through a suburban district reported on the average of 19 accidents daily over a period of several months. Most of the cases might be called trivial, but each required expert attention. The burden finally became so great that the company writing this insurance was compelled to give it up, although it was offered a flat rate of $700 per bus per year for some 40 odd buses to continue. This is not an exceptional case, and will give you an idea of some of the difficulties confronting the careful and sound casualty insurance underwriter in the handling of this type of business.

Not long ago an interstate bus line operating between two large eastern cities had its liability policy canceled by the fifth successive company within 15 months. It finally made a deal with a sixth company, with the provision that a so-called "governor" should be installed on the engine which would prevent a speed of more than 35 miles per hour. About three weeks later an official of this sixth company was passed by one of these buses on the congested highway between these cities. He trailed it and found it to be going 48 miles per hour. That afternoon the policy was canceled again. There are many other similar instances in the confidential files of the insurance companies. Even a "governor" which cannot be manipulated does not always seem to be a sure cure for speed. Another company found that a bus equipped with such a contrivance was making the speed limit around curves and over bad stretches of road where the schedule called for between 15 and 20 miles in order to make up for time lost on the broad highway.

There is, however, a more pleasant and hopeful side to this situation. There are a number of bus operators who are co-operating in every way with the insurance carriers in accident prevention work, and the results are astonishing.

Safety Rules Suggested

I would like, however, to outline briefly some safety requirements in addition to speed regulation, which seem to me to be of importance, as follows:

Drivers should be carefully picked and not under 25 years of age.

The roads over which motor vehicle common carriers operate should be suitable and no certificate should be granted for operation of an inherently dangerous highway.

All employees of the transportation company should be trained in safety work and accident prevention.

The company should have inspectors constantly on the job detecting violators of safety codes and recommending improvements.

In the northern states great care should be exercised in road clearing for winter operations.

There should be some regulation of competitive lines covering the same route, as speed is often the chief ingredient of such competition. There are four fast lines now operating between Chicago and Detroit at express train speed and there are a host of other similar dangerous competitive conditions.

The mechanical condition of all vehicles should be perfect. State utilities commissions should have a force of inspectors at work seeing to it that all proper safety regulations are enforced to the letter.

Simplification and Uniformity

There is still another important field in which state railroad and utilities commissioners can render a most important service to both insurance companies and the motor vehicle common carriers. I already have referred to this under the heading, "simplification, clarification and uniformity of insurance regulations."

The present situation as to insurance regulation can aptly be called a "mess." This is, however, not the fault of any one in particular but is due to the sudden growth of this sort of transportation and the hurry with which its problems had to be met. Each state has its own statutes, rules and regulations, adopted with little or no reference to any other state. Some of them are good, some bad and some of indifferent value, but the lack of uniformity is costly to bus operators and vexatious to insurance companies. This is particularly true in the case of interstate operations, where both the transportation agency and the insurance underwriter are compelled to go to considerable expense in meeting the diverse and often conflicting requirements of the various states through which the business is conducted.

Some few examples of legislative or commission requirements conflicting with standard practices may be of interest to the members of this organization.

1. In some states liability policies must cover injuries to the employees of bus operators. In nearly every state these employees also come under the terms of the workmen's compensation act. It is therefore unnecessary and costly for bus operators

to be compelled to provide this duplicate coverage. In all statndard policies coverage for injuries to empoyees of the assured is specifically excluded, and this is as it should be.

2. In one state liability policies provide protection only for bus passengers. If the operator desires to insure his liability to others he must obtain a separate policy and his expense is thereby increased. If there is any merit at all in compulsory insurance of this kind it seems that protection should be afforded to all persons of the public alike.

3. In several states it is required that the policies also include damage to the cargo and property owned or leased by the bus or truck operator. Damage to such property is excluded in all standard policies and as a rule casualty companies are not permitted by their charters to provide such protection. It is inherently dangerous and is an open highway to fraud.

4. In a few jurisdictions damage suits may be brought against the insurance companies direct. It is well known that such provisions always make insurance more costly as the temptation is for claimants to sue more freely and for larger amounts than they ordinarily would, and for juries to return larger verdicts.

5. Statutes and commission rulings prescribing the limits for which policies must be written often are ambiguous and in some instances even the courts have difficulty in guessing at their meaning; in one state the companies are required to afford protection up to $5,000 for personal injuries for each person injured, without regard to number. In the event of twenty deaths or even twenty injuries in a bus wreck this easily might mean a $100,000 liability for a single accident. In effect this is unlimited insurance which the companies are strictly prohibited from writing by the insurance codes of most states.

6. It seldom happens that compulsory bus insurance laws prescribe the wording of policies or endorsements, and in most cases commissions draw up their own endorsements and require them to be attached to each policy. In many instances the advice of insurance experts is not sought in the formulation of these endorsements and as a result there is always considerable controversy over its wording between the companies and the commissions.

7. It is usual for the commissions to incorporate in the endorsements a clause concerning notice of cancellation, which in itself is not objectionable but the lack of uniformity as to the number of days' notice required is a costly nuisance to any company doing an extensive business.

8. Some laws require that the insurance must cover the assured's liability for *loss* of or damage to property. It would be very difficult to underwrite the *loss* of property for this means theft or disappearance which is entirely outside the scope of liability or property damage insurance and a most troublesome and costly line to handle.

9. It is sometimes required that the insurance policy not only cover the vehicles specifically enumerated but "any other" vehicles which may be employed in the service. This clause is incorporated to permit substitution, but it often permits additions to a fleet which are unknown to the insurance carrier but for which it is liable under such a contract. Such a provision always adds to the expense of underwriting, and the companies cannot be expected to keep inspectors on the job checking bus and truck movements at all times.

There are many other similar laws and rulings which serve no particular public interest but which add materially to the cost of insurance. It ought to be obvious that if there was a higher degree of uniformity in regard to motor vehicle common carrier insurance and that if statutes and rulings conformed not only to standard insurance practices but also did not often conflict with the insurance codes of many states, it would be much easier and much less costly for the insurance companies to write this type of business and consequently less burdensome on bus and truck operators who must pay the high cost of this lack of uniformity.

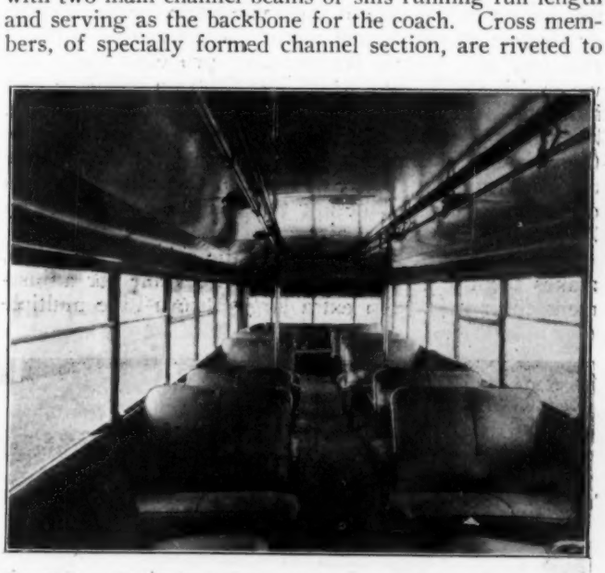
Inadequate Statistical Data

Another feature of this situation deserves attention. Because again of this lack of uniformity in regulation no pure premium statistics are available and there are not today any adequate statistical data upon which proper rates may be predicated. The experience in any one state is of necessity limited and seldom is of sufficient volume as yet to form a background for local rates. In trying to arrive at a national or sectional tabulation to form a rate basis it is also found to be impossible to adjust the $5,000 maximum liability for any one bus in New York to the maximum of $75,000 in Wisconsin, of $80,000 in Nebraska and $25,000 in Colorado. To write liability insurance scientifically there must be present a body of experience sufficient to afford a basis for judgment concerning the probable loss ratio. That body of experience is not now available and hardly can be until there is some uniformity in regulation. The National Bureau of Casualty and Surety Underwriters has been working on this problem for a long time, but as yet has not been able to promulgate a rate manual which is or can be literally followed by the subscribing companies. As a result rates more often than otherwise are determined through individual bargaining between the insurance underwriter and the assured. This largely could be corrected by uniform statutory and commission regulation such as has been suggested.

Motor Coach Driven by Two Motors

A MOTOR coach that will seat 40 passengers and accommodate 36 standees, which is propelled by two 55-hp. motors, has been designed by Frank R. Fageol of the Twin Coach Corporation, Kent, Ohio. The body of the twin coach resembles a Pullman car in appearance. It is 31 ft. 2 in. long, including bumpers and visors, 8 ft. 7 in. in over-all height and 7 ft. 10½ in. in width. The front and rear ends are shaped exactly alike and have the same over-hang, which is 83 in. from axle to end.

The body and chassis are built as one complete unit with two main channel beams or sills running full length and serving as the backbone for the coach. Cross members, of specially formed channel section, are riveted to these sills to support the body frame. The body posts are 1¼-in. tee-sections and begin at the bottom of the body, continuing above the window line as the window posts and curving at the top to form the sides and ends of the roof. The whole structure is re-inforced with sample gusset plates and all joints are hot riveted.



The Urban Coach Will Seat 40 Passengers and Accommodate 36 Standees

The floor, of ¾-in. laminated wood, is flat and made in four large sections. Paneling of Plymetl covers the

sides and ends of the body from the bottom up to the window belt. The upper curved ends of the body posts are covered with sheet steel on the outside and lined with aluminum on the inside. This forms the sides and ends of the roof. The center section of the roof, 42 in. wide and 24 ft. long, is made of ¼-in. Plymetl.

The windows are mounted in special patented non-rattling metal sash and are easily adjusted to any height up to 15 in. The windshield and the rear window are in two sections, each of which is 23 3/16 in. by 28 in.

The entrance door is on the right side at the front and the exit door on the right side at the rear. Both doors are air operated on the Urban models. They are of the four-leaf, fold out type in two sections and provide a clear opening of 28 in. The height of the entrance and exit steps is 13 in. from the ground and the coach floor is 12½ in. above the steps.

The Urban model provides comfortable seats for 40 passengers with ample aisle room for 35 standees. All models have a minimum head room of 6 ft. 5½ in. with the level floor throughout.

The parlor coach model seats 37 passengers comfortably. The seats are of the wicker chair type with high backs and combination spring and pneumatic cushions. The backs are provided with a soft head roll.

Substantial overhead baggage racks of large capacity run almost the full length of the coach. These are arranged on each side so as to preserve the full head room in the aisle.

The design of the twin coach makes it possible to employ what is known as an indirect radiation system of heating which not only ventilates the coach but also heats it. Two six-cylinder 55-hp. Waukesha engines, employing the Ricardo combustion chamber, are mounted amidship, one on each side of the coach between the front and rear wheel. Power is transmitted from each engine to its corresponding rear wheel through a three-speed transmission or, in the case of the gas-electric coach, through an electric generator and motor. Each engine with its radiator, fan, clutch, transmission propeller shaft and worm drive to its rear wheel, constitutes a complete unit independent of the unit on the other side. In operation, both units are handled with a single set of controls from the driver's seat so that they perform just as a single engine. In emergency, either one of the units alone will drive the coach and permit the completion of the run before stopping for repairs.

The location of the engines, in the sides of the coach, makes them and their accessories accessible for adjustment for repair. An extra large Brown-Lipe multiple disc transmission is mounted in the unit with each engine. The two clutches are operated by a single pedal at the driver's left foot, the mechanism being so designed that the clutches will equalize themselves.

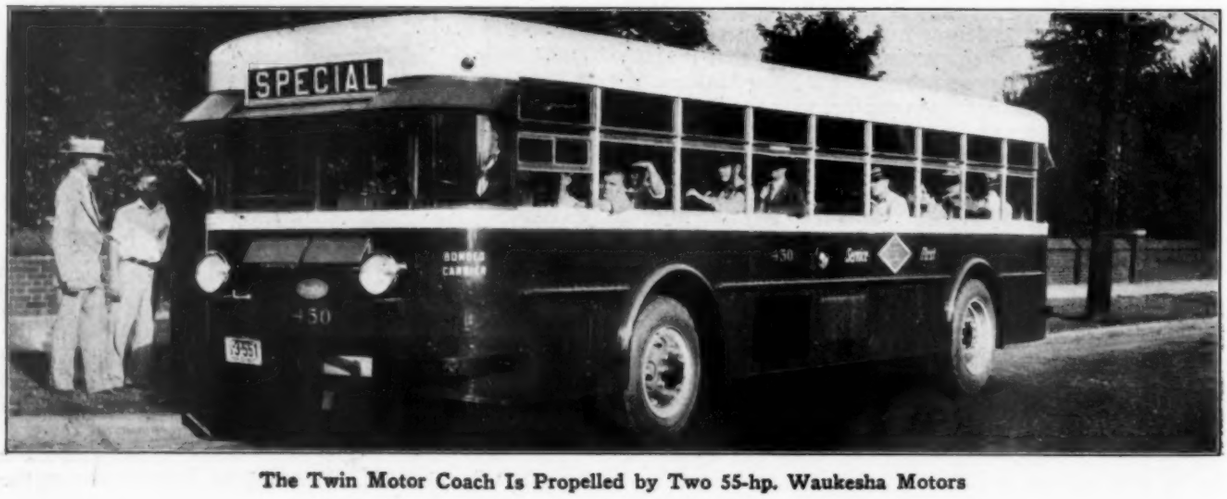
The rear axle is built by Timken to the Twin Coach design and weighs 500 lb. less than the differential type of axle. This unit consists of a center section of heavy steel tubing 4 in. in diameter carrying cast steel housings, worm drives and bearings on each end. Spring seats are cast integral with the housings. The tubular center section is slightly tapered at the ends and the housings are pressed onto these tapered ends under hydraulic pressure and riveted.

Each rear wheel is mounted on a short shaft 3¼ in. in diameter and made of chrome-vanadium steel, the shaft having a large diameter flange forged intergral with it to which the wheel and brake drum are bolted. The shafts are carried on double opposed Timken bearings so located as to be directly over the contact of the tires with the ground. The worm gears are keyed to the inner ends of the shafts which are further supported at these points on non-adjustable roller bearings. The worm drive is what is known as the inverted or underslung type. The brake shoes and their operating mechanism are supported on the outside of the housing.

Each worm housing is made in two sections bolted together in a vertical plane in such a manner that the outer half, which carries all the vital parts, can be easily removed as an assembly. This assembly includes the outer housing, the brake shoes with their hinge-pins, retaining springs and actuating cam, the drive shaft with its supporting bearings and the worm wheel. These assemblies are identical for both the right and left side of the axle and are interchangeable either as assemblies or as individual parts. All maintenance operations on the axle, including the dismounting of the housings, can be accomplished from outside of the coach.

Twin coaches may be had with either standard mechanical drive, or with gas-electric drive. The use of gas-electric drive necessitates placing the engines 35 in. farther forward than mechanical drive models. This results in a slight change in the seating arrangement, but does not affect the seating capacity.

A No. 1105 General Electric generator is used on each engine and a General Electric motor No. 1079 is used to drive each rear wheel. The electric generators and motors are accessible through lower side panels in the body. Independent drive shaft brakes are provided just back of each electric motor. This gives three independent sets of brakes.



The Twin Motor Coach Is Propelled by Two 55-hp. Waukesha Motors

High Speed, Bus Type Trucks are Used by the Murphy Company for Long Distance Freight Handling

Truck Lines Begin Operation in Minnesota

Routes radiating from Twin Cities aggregate 800 *miles in length—Rigid regulation imposed*

By L. H. Gilstad

LIKE a mammoth wheel with Minneapolis and St. Paul at the hub, an extended system of truck lines has just been established in Minnesota. This has come about as a result of a far-reaching order by the Minnesota Railroad and Warehouse Commission which recognizes motor trucking as a major factor in modern transportation.

Tractor and Trailers Leased to Great Northern for Transfer of L. C. L. Freight

Making the logical finding that the Twin Cities must be the center of any transportation system which serves the state and its neighbors, the state commission has made possible the establishment of a great system of motor truck lines, auxiliary to railroad service, to meet a demand which developments so far reveal is growing by leaps and bounds.

A scale of rates has been set up, governed by the Western Classification No. 59, and truck lines are permitted to make a five-cent charge for pickup and delivery. Rigid schedules, close regulation and complete service, even to refrigerator cars when necessary, are part of the Minnesota layout as established by the commission.

With its hands somewhat tied by court decisions and the law, the state commission faced a difficult problem in truck regulation which would be fair to operators and the public.

To meet conditions as they exist in the truck business, the commission established two classes of operators, the principal one being "Class I," general freight carriers, and definitely designated as common carriers.

Of Class I carriers alone, there are close to 800 miles of truck lines radiating from the Twin Cities. One of them is an interstate line into Wisconsin. Of the entire Class I system, almost 500 miles of line belong to the Murphy Transfer and Storage Company, which has long been a big factor in local truck transportation, but which is entering the common carrier field in the state for the first time.*

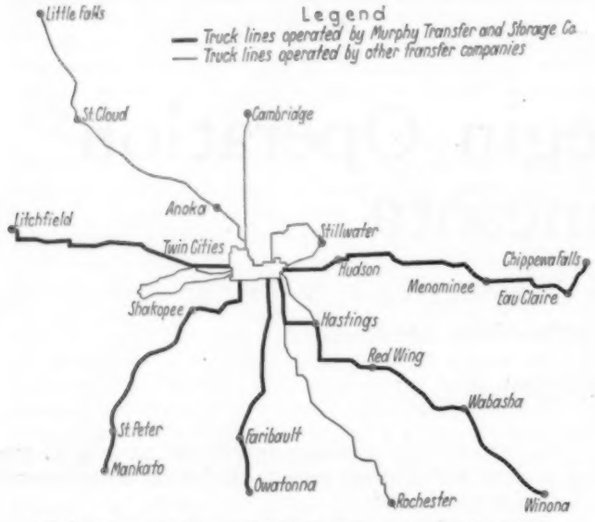
*The plans of the Murphy Transfer Company for the operation of intercity truck lines were described in the *Railway Age* of March 27, 1926, page 927—EDITOR.

Seven Lines Established

There are seven main "spokes" in the wheel which the truck lines make out of the Twin Cities, ranging in length from 20 to 150 miles. Of the seven, five are the lines of the Murphy Transfer and Storage Company. The other lines, and three shorter ones, largely suburban operations, are split among operators who work together as the Minneapolis and St. Paul Truck Terminals. They have consolidated terminal facilities in the two cities.

Facilities costing $650,000 have been turned to the use of its common carrier business by the Murphy Company, working in with the longer existing local operations of the company. Complete terminals and warehouses in both cities, and more than 100 trucks constitute the Murphy plant, where 200 employees are engaged. Orders for more than $75,000 in new rolling stock were placed to prepare for the new operations, complete trucks of the finest type being built especially for the new runs. These trucks are mounted on high speed bus chasses and are equipped wtih pneumatic tires.

The Murphy Company is laying out the new service



New Truck Lines Radiating from the Twin Cities

to fit into its existing operations, which link closely with railroad service. Its trucks serve Twin City railroads every day, the Murphy Company doing extensive hauling for the Great Northern. The Milwaukee, the Soo Line and the Omaha also use Murphy service as a regular part of their local hauls.

The warehouse facilities of the Murphy company play an important part in the co-ordination of rail and truck operations. Extensive facilities for storage and for the work of loading and unloading are available in both Minneapolis and St. Paul. The Murphy Company works in close agreement with one of the big carloading companies in the handling of its less than carload business.

The common carrier lines of the Murphy Company are: Twin Cities to Winona, 120 miles; Twin Cities to Mankato, 85 miles; Twin Cities to Owatonna, 70 miles; Twin Cities to Litchfield, 70 miles; and Twin Cities to Eau Claire and Chippewa Falls, 120 miles.

The other two principal lines in the Minnesota system are those from the Twin Cities to Little Falls, operated by Raymond Brothers; and from the Twin Cities to Rochester, operated by the Witte Transfer Company. One line goes to White Bear and other St. Paul lake points; another to Lake Minnetonka points near Minneapolis; and a third to Stillwater, 22 miles from St. Paul. There is a common carrier line to Anoka, and one in northern Minnesota.

Extensions Expected

Ultimately some of these lines probably will be extended to serve communities beyond their present termini. Completion of highways is a factor in this expected development. The commission was conservative in laying out its program, waiting to see how the business develops on long hauls.

The other general type of truck operation licensed by the state commission, class 2, is that which hauls agricultural and dairy products to market and is permitted to haul freight on the return trip. Regulation is less rigid and schedules more flexible on these lines, although they are required to operate on regular routes. These lines are in all parts of the state.

Central of Georgia Receives Its First Bus Permit

THE Central of Georgia has been authorized by the Georgia Public Service Commission to operate buses in lieu of passenger train service on its Perry-Fort Valley (Ga.) branch line (12.5 miles). The service will be provided by a subsidiary corporation, the Central of Georgia Motor Transportation Company. Schedules operated will be approximately the same as now provided by rail, i. e., two round-trips on week days and one round-trip on Sundays.

The service will be provided under the direction of H. D. Pollard, president of the transportation company, who is at the same time vice-president and general manager of the railroad. The company has ordered one Mack street-car type bus, which will seat 13 passengers and have a compartment for mail and express matter. The new service will probably be instituted about the first of the year.

S. A. E. Holds Transportation Meeting In Chicago

SOME two hundred men, including railway officers interested in the operation of motor buses and trucks, attended the transportation meeting of the Society of Automotive Engineers in Chicago on October 25-27. The program included papers and discussions on many of the problems affecting the operation of buses and trucks by the steam railways as well as by independent operators.

The session on the morning of October 25 was devoted to maintenance, a feature of which was an exhibit of shop equipment and tools. The afternoon of that day was consumed by the reading of the reports of the subcommittees of the Committee on Operation and Maintenance recently organized by the S. A. E. On the second day, freight handling and motor truck operation were discussed. The annual transportation banquet was held that evening. On the last day of the meeting, October 27, the discussion in the morning centered around rail motor cars and motor coaches, while the afternoon program was taken up with the reading of papers on motor coach design and on the situation with respect to legislation affecting motor bus operation.

Handling Express by Tractor and Trailer*

American Railway Express Company transfers 1800 *loads in Chicago daily with* 150 *units*

By M. T. Hanrahan

Superintendent, Vehicle Department, American Railway Express Company, Chicago

TWENTY-THREE trunk lines terminate in Chicago, and the operations of the American Railway Express Company cover approximately 500 trains and 1,000 cars daily. We have 18 terminals between which we handle around 1,800 loads of passing transfer in 24 hours.

Since the flow of express traffic from all parts of the country converges here it will be plain that the economical and expeditious handling of express matter between our terminals is of prime importance. In our business we have only one commodity to sell, service, and we consider that when the public patronizes our company, it is using such a medium because of the urgency of getting its shipments to destination in the fastest possible time. Our responsibilty to our patrons makes us keenly alive to the necessity of getting the best possible machinery to carry out our task.

The history of the express business shows a steady development of handling methods in keeping with the times. When horse-drawn equipment was our only reliance we endeavored to furnish express service by purchasing the best horses and wagons available. When the motor truck came on the scene, the time consumed in performing certain tasks was reduced considerably. While the motor truck was a step forward, it did not fully meet our requirements as to economical handling of express matter, such as solid loads of transfer, for the reason that the power unit was idle during the period of loading and unloading.

This situation caused us to investigate the practicability of tractors and trailers. There were many types on the market but it was necessary that we secure a tractor-trailer unit having the operating flexibility of a motor truck, plus other advantages, namely, more economical operation.

Advantages of Tractor-Semi-Trailer Operation

After considerable study we fixed upon the semi-trailer type as being best suited to our needs, and in 1921 we started with 5 tractors and 15 semi-trailers for use in the handling of cross town or terminal to terminal transfer matter. In the handling of our large volume of express we found that the semi-trailer provided the ideal vehicle unit, principally because during the interval of loading and unloading, the power unit was engaged in productive work. Where terminal facilities were inadequate, the trailer provided the necessary additional space, by reason of eliminating congestion, the faster operation of the trailers making it possible in many cases to provide a direct express car-to-trailer movement. Our requirement of a man-to-man tally of freight between terminals where gas cars and wagons are involved was eliminated by sealing trailer loads, thus speeding up the handling.

The generally satisfactory showing of this initial fleet of tractors and trailers indicated that the plan was sound and that further additions to the fleet might be safely made. The growh of our fleet at Chicago is illustrated in the following figures:

Year	Tractors	Trailers
1922	24	63
1923	31	78
1924	43	100
1925	45	105

Since 1925, no additions have been made to this fleet.

Methods of Operation

The tractor-trailer is operated as a unit by the chauffeur, whose duties consist wholly of hauling and spotting trailers. The loading and unloading of trailers is performed by terminal forces, except in cases of deliveries to large individual receivers of express, where this operation is looked after by the vehicle forces. This arrangement is in the interest of economy.

When a trailer is loaded and ready to move, the coupling of the tractor and trailer is effected automatically without the necessity of the chauffeur leaving the tractor cab. The tractor backs up to the trailer, lifting it by engaging the guide wheels on the trailer with the mounting tracks of the tractor. This operation also locks the trailer to the fifth wheel-coupling device on the tractor. The same operation automatically releases the brake, and elevates the front supporting wheels of the trailer. A lever in the chauffeur's cab reverses the process. The trailers are equipped with internal expanding drum brakes, which prevent them from over-riding tractors on grades or in making stops on the level.

When the tractor-trailer service was first installed, the operation of the units, consisting of 5 tractors and 15 trailers, was not very difficult, but when additional units in large numbers were added to the service, the operation and control of the units became a problem. It was apparent to us that if we were to keep the tractors and trailers under control it would be necessary to improve our methods of operation.

We developed a system of control by means of a chart or despatcher's board whereby the location of each unit is known at all times to the despatcher in charge of the tractor-trailer operations. From reports which come to him from the terminal despatchers, he knows what trailers are enroute to terminals, and which ones are standing loaded or empty or are about to be loaded. This tractor board carries the names of all of our terminals and other points where trailer service is used during the day.

For each trailer in our service we have a numbered peg corresponding to the number of the trailer. The numbers on these pegs are baked on celluloid buttons, black numbers on a white background. As the movements of these trailers are reported to the tractor despatcher, he moves the pegs around according to

* From a paper presented at the meeting of the Society of Automotive Engineers in Chicago on October 26.

whether the trailers are enroute loaded or empty, standing at a terminal loading, or unloading or empty. By referring to this chart he sees at a glance the number of trailers standing loaded at all terminals or any one terminal, and when a terminal calls for empty trailers, he refers to the chart and arranges to get to that particular terminal in the shortest time possible, all the trailers standing at other terminals with loads for the terminal calling for service. This method prevents lost motion and the possibility of despatching to any terminal more service than is required. A driving schedule is maintained which is rigidly adhered to, and any variation therefrom must be fully explained by interested chauffeurs.

Ratio Between Loaded and Light Movements

For the efficient operation of this equipment it is vitally necessary that the proper ratio be maintained between the loaded moves and the empty and light moves. Our experience shows that approximately 65 per cent of the total moves made are loaded moves. Our loads are not always capacity loads. Delayed trains and other operating conditions cause fluctuations in the amount of traffic to be handled between terminals. At certain hours of the day or night all trailers are moving with capacity loads, while at other times the Traffic thins out. Our average loaded moves per tractor per eight hours on a yearly basis for the past four years have been 13.25.

Our tractor fleet is operated in three eight-hour shifts daily. The middle shift is made on the street, the others in the garage so that the tractors may be gassed and oiled and given the necessary mechanical attention. There was comparatively little increase in garage facilities due to the fact that, except for repairs, the trailers are never in the garage, and so far as the tractors are concerned, about one-third of the total complement is all that we have in the garage at one time.

The advantages of this type of equipment may be summed up as follows:

1. One tractor serves for three hauling units, each one of which has doubled the ordinary express vehicle capacity.
2. Uninterrupted loading, due to waiting semi-trailers.
3. Saving of valuable terminal platform space because of the ever-present loading space provided by the semi-trailers.
4. Decrease in garage space.
5. Elimination of waiting time on the part of the chauffeurs for the preparation of loads.
6. Constant productivity on the part of the principal part of the investment, the tratcor, which is not idle during loading or unloading.

Tractor and trailer equipment is not readily adaptable to all cartage problems, and the situation should have careful study before such service is installed.

The Trend of Motor Coach Design*

Changing performance standards demand more attention to factors affecting operating economy and passenger attraction of buses

By K. J. Ammerman
Assistant to President, American Car & Foundry Motors Company, New York

EXPERIENCE in the last few years indicates that motor coaches, to be safe and durable on the fast schedules which are now effective in many localities, must approach railway equipment in weight per passenger. Motor coach engineers and manufacturers can improve, and have improved, on railway construction in the use of better materials and finer workmanship but they are limited in this by the desire of the operator to buy at the lowest possible initial cost. Fine workmanship and high grade materials are least visible to the operator where they do him the most good.

The evolution of steam railroad car construction provides a good example of the effect of speed on weight requirements consistent with safety and durability. Only a few years ago a standard passenger car weighed about 40 tons while today a car with no greater capacity weighs 60 tons. The railroads did not penalize themselves by this 50 cent increase in dead weight without good and sufficient reasons. This increase in weight raised their operating costs with no increase in revenue to match them. The reason for this weight increase was the demand by the traveler for higher speed. The railroads tried to meet this demand with the equipment available, but it soon became evident that the light equipment then in use would not stand up under the terrific strains imposed through the higher speed and, in addition, was not safe.

The motor coach today is going through much the same evolution; an evolution which is more rigorous than that of the steam railroad for, in addition to the demand for higher maximum speed, we have the demand for greater acceleration and deceleration. Acceleration and deceleration have a much greater effect on schedule speeds in the case of the motor coach than in the case of a railroad, due to far more frequent stops. Acceleration and deceleration also impose strains on chassis and body far greater than increased maximum speeds impose.

It is therefore inevitable that if we are to meet this demand for increased schedule speed we must build our coaches heavier, and it is equally inevitable that their cost will be proportionally higher. Conversely, it is evident that the light weight, large capacity coach must be slow and sluggish if it is to live long.

Simplicity in Chassis Design Desirable

Simplicity of chassis design, consistent with the ability to perform the service for which it is intended, is the predominating characteristic of good design. If

* From a paper presented at the meeting of the Society of Automotive Engineers in Chicago on October 26.

simplicity is attained, the operator benefits through lower cost of maintenance. Simplicity, of course, is relative and since nearly all engineering is a compromise between what we want to do and what we can do, an engineer sometimes makes a less simple design for a given part to achieve an objective in some other direction.

There are several ways in which an engineer can achieve the desired results in the design of the various units making up a complete chassis. For instance, some engineers mount the radiator on the chassis frame; while others mount it on the engine. We are all conversant with the various types of valve mechanism, each of which has its adherents with sufficient reasons to justify its use in the eyes of the engineer. There is also a division of opinion as to the best place for the transmission—as a unit with the engine, or separated from it by a short drive shaft with universal joints. As for rear axle design, one engineer may prefer a full Hotchkiss drive and another may prefer to drive through radius rods.

There are several points in chassis design, mention of which will not be stepping too heavily on any one engineer's toes. The ever-increasing demand for passenger capacity has a tendency to influence engineers to design coaches with excessive rear overhang. This influence is one easy to succumb to, as it achieves the desired results at a minimum cost, since the wheel base can remain the same and the frame channels can be merely lengthened. The specifications with respect to overhang, as they now exist in those state regulations which cover this point, have no effect on limiting overhang, as I do not know of any coach which has an overhang which is not well within the most restricted limit. Regardless of any state regulation, it behooves motor coach designers to curb this tendency, as excessive overhang increases rear tire wear and makes turning difficult.

Overhang in the front of a coach is as important, perhaps more so, in case of driving around a parked car to pull up to a curb or safety aisle, since excessive front overhang may cause injury to people waiting to board the coach. Here again sharp turns in city streets may result in damage to vehicles coming out of the street into which the coach is turning.

The Effect of Weight Distribution on Tires

Hand in hand with the question of overhang comes that of weight distribution. Many operators have had sad experiences in trying to show a satisfactory profit with coaches which are so designed as to impose too great a burden on either the rear or front tires. Since four tires are entirely practical under the rear of a coach but impractical under the front, the logical ratio of weight distribution is 2 to 1. This ratio cannot be strictly carried out under all conditions due to the shifting of weight resulting from the number and position of passengers, the amount of baggage carried in the case of parlor car coaches, and the number of standees in urban or street car types.

The necessity of adhering as strictly as possible to this ratio would not be so great if it were not for the fact that the tires usually specified, particularly on the heavy type of coach, are of a size just sufficient to carry the load. This tendency to keep tire sizes as small as possible is, of course, forced by the necessity for keeping weight and initial cost as low as possible. While tires which are oversize for the weight they must carry would eventually prove beneficial to the operator through lower tire cost per mile, it is a difficult matter for any one manufacturer to obtain the increased differential in price resulting from oversize tire and equipment.

If the proper weight ratio is not maintained, a tire size must be specified which is sufficiently large to carry the under-tired end of the coach. This results in the other end of the coach being considerably over-tired, since it is obviously impractical to equip a coach with two sizes of tires. This solution of the problem can have only one result—excessive tire cost per mile for the operator. In some cases where weight distribution is particularly bad, it might even be necessary to have special size tires made to carry the load satisfactorily—to the obvious disadvantage of the operator.

Passenger Comfort Sells Rides

Perhaps the most important item affecting the selling of rides is passenger comfort. The modern private automobile is now a relatively easy riding vehicle. Some of the modern coaches are easy riding, the equal of the best private automobiles, but some are about as comfortable as a lumber truck.

Long wide springs with a period of vibration approaching the period of vibration to which the human body is most accustomed, namely, that of walking, is the right road to riding comfort from a chassis standpoint. From a bus body standpoint, the seat cushion is the predominating factor. In many cases, too little attention is paid to the relation between seat cushion vibration periods and chassis spring periods. The riding qualities of a seat cushion, I am afraid, are frequently determined when the coach is standing still. Many a designer has thought the problem solved when appraised in this manner, only to find when the coach is running along the road that the period of cushion vibration synchronizes with the period of chassis spring vibration, with most uncomfortable results.

While we are on the subject of seat comfort, let me say that, in my opinion, perhaps the greatest retarding influence on the use of buses as a means of transportation is the lack of leg room. In a great many coaches a person approaching six feet in height cannot possibly sit without pressing his knees against the back of the seat in front of him. All of the public utility commissioners and inspectors whom I know are small or medium height men, but some day a tall commissioner or inspector will ride in a coach with insufficient leg room and say, "Here is something we missed."

One of the problems the motor coach manufacturer has been attempting to solve is the baggage problem. To date there have been four ways in which this has been accomplished: (1) The baggage carrier on the roof; (2) a space made available in the rear of the coach by the use of taxicab seats from the wheel-housing backward; (3) baggage racks, either solid or metal rack type, above the passengers' heads; (4) the parlor observation type with baggage space under the rear half of the body, which is elevated a half story.

The baggage carrier on the roof will, in my opinion, gradually decrease in popularity because of its inaccessibility and comparative lack of protection for the baggage, although there has been an attempt to eliminate this objection through the use of a box on the roof instead of rails, but this detracts materially from the appearance of the coach. The use of taxicab seats in the rear of the coach, while allowing baggage to be carried where it is protected, reduces the number of comfortable seats when passenger capacity and not baggage capacity is needed.

The remaining two types, I believe, will predominate in the future. The overhead racks provide space for light weight baggage which the passenger can handle as he does in a railroad train. This will be convenient when a parlor car type of coach is used in territories

where there are comparatively short hauls. The parlor observation coach, with the baggage enclosed in the lower rear half of the body, makes it possible to carry steamer trunks as well as hand luggage, and while this type requires the attention of the driver when unloading passengers having baggage, this is not serious in intercity operations where most of the passengers are unloaded at one terminal. This type of coach lends itself to two distinctive types of operation. First, in territories which are dotted with small towns with infrequent train service, the traveling salesman making his rounds can put his sample cases in the baggage compartment, thus avoiding the necessity of hiring a car to take him to the next small town, or waiting for several hours for the next train.

The second type of operation is revenue express service. The ability to lock the compartment will make it possible to develop an express business which will materially increase the revenue on the line without interfering with the carrying of passengers. At least one such operation is being developed in the east at the present time.

A large percentage of operators, the number of whose coaches run into two and three figures, have preconceived ideas as to the ideal street car or parlor car body, and the unfortunate part is that no two of them agree. Many of the larger coach operators, such as railroads and street railways, have their own engineering staffs which have been accustomed to laying down specifications on rail equipment and see no reason why they should not do the same thing in ordering motor coach equipment. This tendency toward special equipment is confined almost entirely to the coach body and not to the chassis.

The modern motor coach body is not primarily a development by the manufacturers alone, but is rather a development by the manufacturers influenced by years of experience of hundreds of operators. I do not think there is sufficient variation in the transportation requirements of, say, fifty operators to justify fifty designs of coach bodies. These off-standard specifications do not, of course, affect the complete design of the coach body. Sometimes the change is a five inch narrower body, a different aisle space, or a roof with three inches more headroom. One operators may want this three inches more headroom the full width of the body and another may want it only in the center with a crowned roof, sloping down to sides of the normal height. Simple as these individual changes may appear, they represent costs which are out of proportion to the benefits derived.

Christening the S. P.'s First Bus to Operate in Oregon

Murray Coach Bodies Made of Duralumin

THE Murray Corporation of America, Inc., Detroit, Mich., which has entered into the engineering and production of coach bodies, has developed a design in which all parts of the body may be quickly replaced from stock parts. The bus body frame work is made entirely of extruded duralumin members and covered with duralumin plates, riveted in place. Thus, the body is a unit wholly made of metal, combining lightness and strength. An ordinary bus body of 29 or 30-passenger capacity weighs about 4,700 lb. A Murray duralumin body of equal size and capacity weighs approximately 3,000 lb. or a saving in weight of 1,700 lb.

The bodies are constructed in standardized units of parts and assemblies. Standardized side plates, ribs and assemblies are all available for easy replacement in case of accident or wear. With all plates, parts and assemblies numbered, punched, shaped and ready for riveting into place, it is only necessary for the operator to order parts or assemblies by number.

Interior View of a Murray Coach Body Made of Duralumin

Protex safety glass is used in all windows and the windshield is made of Triplex shatter-proof glass.

The special emergency door is at the rear, which is furnished in addition to the doors required by certain state laws. This door opens naturally in case of an upset and gives easy exit.

Riding comfort is insured by special Murray unison chairs in which both the seat and back move as a unit. The spring is located underneath the chair so that the chair and passenger move in any direction in unison. A rebound snubber prevents violent return and a special compensating spring equalizes the spring action for persons of varying weight.

The bus interiors are done in period designs and harmonious colors. Special provision has been made for decorative roller shades that give full vision from all windows. Ventilation and heating have been carefully designed with consideration for the passenger's comfort. Shades, non-glare lighting fixtures and electric wiring are incorporated in bench-assembled panels fastened above the windows.

A CHICAGO-MILWAUKEE MOTOR BUS SERVICE on a 3½ hour schedule for the 80-mile trip has been established by the Chicago, North Shore & Milwaukee. Two trips are made in each direction daily, one in the morning and the other shortly after noon.

Buses Used in Flood Emergency

MOTOR coaches served as an auxiliary to the railroad in three principal phases of the Boston & Maine's experience under New England flood conditions:

(a) Bus service was given where rail service was impossible.

(b) Bus service was used to replace rail passenger service where conditions made it desirable to concentrate on freight movements.

(c) Bus service was used by maintenance of way forces in moving men and materials where work trains could not operate.

In the three weeks' period since the floods, the Boston & Maine has operated about 50,000 bus miles in these three classes of service and in supplying emergency service for mail, newspapers, etc.

The value of motor coach service as a railroad auxiliary under these conditions is obvious when it is recalled that two important main lines were out of commission in one or more places for from 48 to 72 hours, and less important main lines were tied up for periods of 4 to 12 days, while some branches were without rail service for from 10 days to three weeks. To the fact that the motor transport organization is manned largely by former railroad men is attributed its efficiency under such conditions. The motor coach under these conditions was used in new ways. For instance, the railroad's "Minute Man," Boston to Chicago, was able to maintain service by motor coach connection between Williamstown and Troy or Albany.

Motor coach emergency operations were principally from Concord, N. H., north and west; White River Junction, north, south and east; Greenfield, south, north, east and west; North Adams and Williamstown west.

Motor coaches in some cases operated in fleets to accommodate all passengers customarily traveling on certain trains and all classes of railroad tickets were honored.

"Do's" and "Don'ts" Of Tire Operations*

By L. G. Fairbank
Manager, Truck and Bus Tire Dept., Firestone Tire & Rubber Co., Akron, Ohio

THERE are three fundamentals to satisfactory tire performance: The proper size tire to carry the load; sufficient and constant air pressure; and proper care of tires in service.

A recent check on about 150 bus fleets over the country indicates decided progress during the past year in the care of tires, but it also indicates the waste of millions of tire miles annually, and the need of a standard tire operating routine backed up by the management. I will not attempt to describe the detail of this routine but I would like to give three "Don'ts" and eight "Do's" that will form the outline of a practical tire plan.

Three "Don'ts"

1. Don't kick or pound a tire to test air pressure; use an air gage.

2. Don't line up wheels with the eye; use a wheel aliner.

3. Don't guess at brake adjustment; use a brake testing machine if possible.

Eight "Do's"

1. Find out the weight of the front and rear ends of the bus by actually weighing it with a full load, to determine the proper size of tire to use. If the weight exceeds the carrying capacity of the tire, the operator cannot secure the lowest tire cost.

2. Check each tire for air pressure every 48 hours. Be sure your air compressor is of ample capacity and that you have plenty of air lines conveniently located. In larger operations it is not practical to move the bus to the air hose, and unless you make it easy to inflate buses where they are parked you will find it difficult to maintain constant air pressures. Establish a system of checking air pressure regularly which will prevent employees from marking cards "Air O.K." unless the pressure is actually checked with an air gage. Be sure that the valve on the inside of dual tires can be reached easily with an air chuck. We find many cases where it is necessary to crawl under the bus or remove the outside tire in order to inflate the inner tire. It is difficult to make your service man go to this effort, and the tire is usually neglected.

3. A sufficient number of spare wheels to maintain service is essential, perhaps one spare wheel for every 12 running wheels.

4. Have brake and wheel alinement equipment and a regular routine for testing. Negligence will ruin tires.

5. Have a tire service room with tube racks, test water tank, tire tools, stock, etc. You will never find an organized tire service unless the tire man has a place he can call his own.

6. Drivers should receive regular class instruction on tire care. Moving pictures, charts, and tire exhibits are available to help you organize this instruction.

7. There are two essentials in tire repairing: Establish a system of knowing what tires can be profitably repaired, and be sure you receive expert tire repair work.

8. Set up a system of records so that every tire, every repair and every tire road delay can be accounted for accurately. This will enable you to locate your trouble and correct it.

There has been too much guess work and carelessness in the handling of tires and tire service, and bus operators are fast recognizing the fact that tire cost can be controlled and reduced by a proper program and by proper management just the same as any other part of their operations.

* From a talk at the American Electric Railway Association Convention at Cleveland, Ohio, on October 3.

Standard Classification of Bus Accounts Interpreted

THE Committee on Bus Accounting of the American Electric Railway Accountants' Association in the report which it rendered at the convention of the association at Cleveland, Ohio, on October 3-6, answered several questions relative to the application of the standard classification of bus accounts in certain instances. The standard classification set up by the American Electric Railway Accountants' Association, which was approved by the National Association of Railway and Utilities Commissioners, was reproduced in the Motor Transport Section of November 27, 1926, page 1077, in an article entitled "Approve Uniform Account-

ing Classification." The following questions and answers interpret certain of these classifications:

Question—To what account should be charged rentals paid for garages for storing buses? Answer—Account 1302 covers the rent of garages where such property is used to maintain equipment properly. Account 1318 covers garage rental for storage of revenue vehicles over night.

Question—To what account should be charged the cost of tire chains and installation of the same? Answer—Account 1328. The classification committee suggests that when the classification is revised, provision be made in Account 1327 to cover cost of tire chains, etc.

Question—Is the cost of a spare tire and wheel a proper charge to capital account? Answer—Yes, if the but was originally purchased with a spare tire and wheel as part of equipment, or if it is considered that to equip a bus properly for service a spare tire and wheel should be included in the equipment.

Spare Tires Charged to Capital Account

Question—If the above is a proper charge, then would two spare tires required for a car be a proper charge to capital investment? Answer—If the nature of the business or the service for which it is used requires two spare tires to equip the car properly for service, it would be proper to capitalize the same.

Question—Instead of an additional spare tire and wheel carried on the car, a spare wheel and tire are placed at different points en route to be used in emergency should a second puncture occur; can these tires and wheels be properly charged to capital? Answer—Tires and wheels stored for use in cases of emergency should be carried in materials and supplies account and not charged out until used.

Question—To what account should be credited revenue arising from buses used on special park or sight-seeing lines at an established rate of fare, which lines are operated more or less regularly? Answer—When such lines are regularly established lines with a specified rate of fare authorized, the revenue should be credited to Account 1201 "Passenger Revenue." When such lines are not operated regularly and are not covered by a certificate of public convenience, revenue should be credited to Account 1203 "Special Bus Revenue," regardless of whether the fares are collected on a basis per person or on a chartered car basis.

Underwriters Test Triplex Glass Windshields

A HEAD-ON automobile collision indoors, but without the use of automobiles, was reproduced by the Underwriters' Laboratories, Chicago, in the course of the exhaustive tests of the Triplex non-shatterable glass manufactured by the Triplex Safety Glass Company, Inc., Hoboken, N. J.

A special steel support for the windshield was bolted to a standard automobile frame mounted in connection with the laboratory bumper testing machine. A one-ton weight, released from gradually increasing heights on an incline, was used to deliver the impact. Ordinary plate glass shattered at 947 ft. lb., dislodging three-fifths of the windshield and throwing fragments violently over a radius of 8-ft. The triplex glass remained unbroken under an impact of 1,404 ft. lb.

Compression tests showed plate glass rupturing under an average load of 3,773 lb., whereas an average load of 10,560 lb. caused the non-shatterable plate glass to buckle, but without any separation of the three layers of its structure.

Other tests duplicated the action of a human body being hurled against the windshield. Here the laminated glass produced no cutting edges under the same conditions which smashed other types of windshields.

Tests were also conducted for vibration, temperature changes, bending, twisting, concentrated impact, fire, water penetration, frosting and light transmission. Triplex glass, the report finds, uses no wires in its structure and resembles plate glass in appearance, but, owing to its non-shattering quality, it "should contribute in high degree to the reduction of injuries to persons involved in accidents."

Triplex glass is made of laminated sheets. Two pieces of thin, specially selected, ground and polished glass are each coated with chemicals to form a cement coating. A layer of pyroxylin plastic is introduced between the two coated sheets of glass to form a sandwich which is united to form a single sheet of laminated glass by heat and pressure. The sheet is then sealed at all edges to prevent the action of air and moisture on the pyroxylin plastic and chemicals. The process requires seventeen operations.

A Communication

How the B. & M. Prepares for Winter

BOSTON, MASS.

TO THE EDITOR:

Referring to your recent article in connection with the preparations made for winter operation, the following may be of interest:

As a part of the Boston & Maine activities are in central New Hampshire, with heavy snowfall and severe winter weather, we make a special effort to carefully overhaul heaters on all equipment, making sure that valves are working properly and that there are no loose joints to permit gases to escape into the buses. Where there is considerable dead time between trips, and no garage nearby, operators are instructed to start their motors in ample time to have the cars comfortable before departing. At its best the present system of heating through the exhaust pipe is none too satisfactory, and we are experimenting with other types of heating.

Chains are carefully checked, and stockroom employees keep an adequate supply on hand at all times to meet emergencies. We experience more or less icy conditions, necessitating the use of chains on all equipment and on some runs, on both front and rear of the buses.

Windows, windshields and doors are given attention, using weather strips or other material as necessary to make them tight. It is important that ventilators are working properly and that all concerned understand the use of them.

The carburetors are checked and the size of their jets changed as necessary. A lighter grade of oil is used and on some runs the oil is changed more frequently during severe winter weather. We find it more satisfactory to use only water in the radiators, and by supplying radiator covers or shutters and not allowing the motors to remain idle in extreme weather, we avoid any danger from freezing.

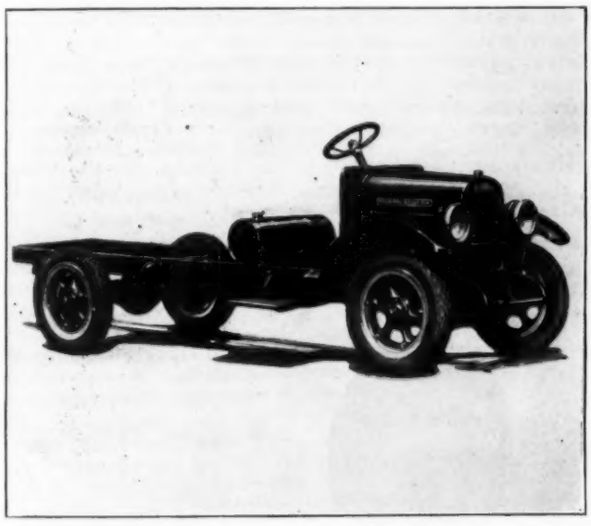
We do not operate any snow removal equipment to speak of. On one route in the central part of New Hampshire we found the towns were not equipped to handle the snow, and the Boston & Maine purchased a tractor for this route, working out an arrangement with the towns whereby we would be paid a certain sum on an hourly basis for plowing of the highway used by the bus line. The plowing was so satisfactory that we were requested to plow other roads.

R. J. LITTLEFIELD,
Manager, Motor Coach Service, Boston & Maine Transportation Company.

The Federal Scout One-Ton Truck

THE power plant of the Federal Scout one-ton truck, manufactured by the Federal Motor Truck Company, Detroit, Mich., has a 2⅞-in. bore by 4¾-in. stroke, and develops 44.5 hp. at 2,800 r. p. m. The 2⅛-in. cranskshaft has four main bearings with a total length of 5 9/32 in. The crankshaft and flywheel are balanced statically and dynamically to ½ oz. limits. The pistons are also balanced in sets of six to ½ oz. The fan and water pump are constructed in one unit and are bolted to the front end of the cylinder casting. The fan runs on ball bearings. Lubrication is provided by an oversize gear pump driven through spiral gears from the camshaft. Oil is sucked through a filter and forced through a large header to the main bearings. Passages are also drilled from the main bearings to the camshaft bearings.

The various parts of the engine are accessible for repair work. By loosening one set screw the distributor may be taken off. The starter is located in an accessible position on the flywheel housing. The oil pan is removable without disturbing any oil line or loosening either



The Federal Scout Six One-Ton Chassis

the crank case or flywheel housing. The tapped blocks come out as units by loosening two bolts and the valve covers are large enough to provide ample room for wrench clearance while adjusting valves. The piston and connecting rod assemblies are all removable from the bottom.

The frame is a steel channel section 5 in. deep with six heavy pressed steel cross members hot riveted to the frame. The frame is supported by semi-elliptic springs. The front axle is a drop forged I-beam of alloy steel fitted with tapered roller bearings. The axle shafts are of the semi-floating type fitted with tapered roller bearings.

The standard wheel base is 124 in., with a loading space of 91 in., back of the driver's seat. The body allowance is 750 lbs. and the chassis weight is 2,500 lbs.

TWO INDEPENDENT bus companies operating in the state of Oregon have appealed to the Public Service Commission of that state to cancel permits granted to railways to operate motor buses, charging that the railways have been running them at a loss to stifle competition.

Motor Transport News

Contest Jurisdiction Over City Streets

The city of St. Louis, Mo., has asked the Public Service Commission of that state for a rehearing of the case in which the Yelloway, Inc., was granted a permit to operate a bus line from St. Louis to Kansas City. The city alleges that the commission erred in granting a certificate of convenience and necessity to the company to operate over the city streets in St. Louis, contending that only the city has jurisdiction over its streets. In granting the permit to the Yelloway company, the commission ruled that cities have no jurisdiction over through bus lines which merely have their terminals in the city.

"In the case of cross-state buses," the commission order said, "the city of St. Louis has no more right of control than the smallest town or village in the state. The city is a part of the state of Missouri and it cannot, by ordinance or otherwise, nullify or make inoperative any of the laws of this state."

Removal of Excise Tax on Motor Buses Requested

Testimony to show that the continuation of the excise tax on motor buses is unnecessary, and unfair to the motor bus industry, was presented at a hearing before the ways and means committee of the House of Representatives at Washington, on November 7. The case for the bus operators was presented by S. A. Markel, chairman of the legislative committee of the Motor Bus division, American Automobile Association.

Mr. Markel contended that the excise tax was an emergency war time levy which is no longer justified, now that the emergency has passed. He stated that the bus operators are particularly concerned with the removal of the three per cent tax on automotive passenger vehicles, which applies to motor buses as well as to automobiles, since they feel that a questionable discrimination has been countenanced by the government in classifying and taxing the bus under the same head with the automobile, when the bus ranks as one of the largest of the modern public utilities.

I. C. C. Holds Hearing on St. Louis Transfer Proposal

The Interstate Commerce Commission on November 1 began a series of hearings in St. Louis, Mo., on the proposal of the railways entering St. Louis and East St. Louis, Ill., that a new tariff be put into effect giving to the Columbia Terminals Company the exclusive right to handle l.c.l. transfers between the railway freight stations in the two cities. All of the railways involved, with the exception of the Chicago & Alton, joined in asking the approval of the proposed tariff. Representatives of the chambers of commerce of St. Louis, East St. Louis, and Wellston, and representatives of large shippers organizations appeared at the hearing in opposition to the plan.

John W. Clark, assistant traffic manager of the Cleveland, Cincinnati, Chicago & St. Louis, outlined the proposal on behalf of the railways. The proposal, according to Mr. Clark, is to reduce the number of off-line freight stations from 12 to 7, all of which would be operated by the Columbia Terminals Company for the railways. Mr. Clark stated the railways' conviction that this would cut down the expenses of operation and expedite the movement of freight through the centralization of the transfer service.

At the present time there are two approved transfer companies in St. Louis, the Columbia Terminals Company and the Central Transfer Company. A third approved transfer organization, the Fidelity Transfer Company, was absorbed by the Columbia Terminals Company several months ago. The Central Transfer Company is said to handle slightly more than eight per cent of the l.c.l. transfer business in St. Louis and East St. Louis, the remainder being handled by the Columbia Terminals Company. The opposal of the shippers to the proposed new tariff, accord-

ing to their testimony, was based upon their fear of the results of the monopoly which the new tariff would effect.

Cotton Belt Proposes Bus and Truck Operation

The St. Louis Southwestern has applied to the Texas Railroad Commission for permission to discontinue the operation of the two passenger trains operating in each direction daily between Tyler, Tex., and Lufkin, a distance of 94 miles, and to substitute for them buses and trucks operating on more frequent schedules. A hearing on the application will be held before the commission at Alto, Tex., on January 16.

The Cotton Belt line between Tyler and Lufkin is paralleled by a hard-surfaced highway over which an independent bus and truck line has been operating. This bus and truck line has been operating under an exclusive franchise granted by the railroad commission under the terms of the Texas law applying to common carrier motor vehicles. In the view of the exclusive nature of the franchise held by the present independent operator, the Cotton Belt proposes to contract with this operator for bus and truck service instead of operating its own highway vehicles. Under the terms of the proposed contract four round trip bus schedules would be operated between Tyler and Lufkin daily instead of the two round trip train schedules now existing. The buses would use the facilities of the railway stations along the line, and in addition would make the stops at other points in the towns that they now make. The rate of fare to be charged on the buses would be the same as that now in effect for transportation by train and the railway tickets would be honored on the buses. The railway line would be maintained for freight service, and in emergencies which might prevent the operation of the bus line, passenger service over the railway line would be rendered. It is understood that in case the proposed replacement of train service is approved by the Texas Railroad Commission, new bus and truck equipment to be operated under the contract will be purchased by the Cotton Belt.

Statistics presented by the Cotton Belt to the railroad commission show that the privately owned automobile has been responsible for the loss of revenue from passenger service on the Tyler-Lufkin line. The ticket sales on the railway between Tyler and Lufkin, during the first nine months of this year, were $27,958, while the ticket sales on the independent bus line were $27,531, a total of $55,489. Three years ago, before the improved highway was completed between Tyler and Lufkin, the Cotton Belt's receipts on this line for a similar period were $82,102.

Orders for Equipment

THE NEW ENGLAND TRANSPORTATION COMPANY has ordered three A.C.F. parlor observation coaches from the American Car & Foundry Motors Company.

THE NEW ENGLAND TRANSPORTATION COMPANY, highway subsidiary of the New York, New Haven & Hartford, has received delivery on one Mack 230 in. wheel base bus chassis.

THE EASTERN TENNESSEE & WESTERN NORTH CAROLINA MOTOR TRANSPORTATION CO., the bus operating subsidiary of the Eastern Tennessee & Western North Carolina, has ordered a model 53 bus from the White Motor Company, Cleveland, Ohio.

THE CENTRAL OF GEORGIA MOTOR TRANSPORTATION COMPANY, highway subsidiary of the Central of Georgia, has ordered one street-car type Mack bus with a compartment for passengers and mail and seats for 13 passengers from the Mack-International Motor Company.

Among the Manufacturers

P. G. McDonough has been appointed director of sales of the Selden Truck Corporation, Rochester, N. Y.

The name of the **Racine Radiator Company,** Racine, Wis., has been changed to the **Perfex Corporation,** and the company is moving to Milwaukee, Wis.

Henry D. Hukill has been appointed manager of the Automotive Brake division of the **Westinghouse Traction Brake Company,** with headquarters at Wilmerding, Pa.

H. T. Boulden, president of the Boulden-Whittaker Company, New York, has been appointed manager of the commercial car division of the **Pierce Arrow Motor Car Company,** with headquarters at Buffalo, N. Y.

T. Latimer Ford, who has been in charge of sales in the Pacific Coast territory for the **American Hammered Piston Ring Company,** Baltimore, Md., has been elected vice-president in charge of automotive replacement sales, with headquarters at Baltimore.

Saunders Jones, vice-president of the southern region of the White Company, with headquarters at Atlanta, Ga., has been transferred to the headquarters of the company at Cleveland, Ohio. He will continue to have the title of vice-president and will act as assistant to the president of the company. **C. B. Cowan,** district manager, with headquarters at Birmingham, Ala., has been appointed acting manager of the southern region, with headquarters at Atlanta, pending the appointment of a vice-president to succeed Mr. Jones.

Motor Transport Officers

O. F. Caeser, general manager of the Northland Transportation Company, the bus operating subsidiary of the Great Northern, with headquarters at Minneapolis, Minn., has resigned to become general manager of the Motor Transit Company, Chicago.

Fred A. Klock, superintendent of motor coach operations of the Chicago, North Shore & Milwaukee, has been appointed general manager of the motor coach division, with headquarters at Chicago. Mr. Klock has also been appointed general manager of the following associated bus companies operated by Samuel Insull and associates. Metropolitan Motor Coach Company, Western Motor Coach Company, Northwestern Transit Company, and Northern Illinois Service Company. **Joseph M. Sills** has been appointed assistant to the general manager of all five companies, with headquarters at Chicago.

Robert H. Newcomb, assistant to vice-president of the New York, New Haven & Hartford, with headquarters at Boston, Mass., has resigned effective November 1, to engage to the private practice of law and will be associated with James M. Hooper, attorney, at Boston.

R. H. Newcomb

Mr. Newcomb was born on March, 20, 1877, at Lynn, Mass., and was educated in the public schools of that city and at Boston University, from which institution he was graduated in 1901 with the degree of LL.B. From 1903 until 1913, Mr. Newcomb was engaged in newspaper work in Washington, D. C., and on March 4, 1913, entered the service of the New York, New Haven & Hartford. In the latter part of 1914 he went with the Boston & Maine, serving in the traffic department and on general work until the time of federal control. During this time he was in the service of the federal manager of the Boston & Maine, and upon the return of the railroads to their owners on March 1, 1920, Mr. Newcomb was appointed executive assistant of the Boston & Maine, with headquarters at Boston. On February 1, 1924, he was appointed assistant to vice-president of the New York, New Haven & Hartford, which position he was holding at the time of his resignation. Mr. Newcomb was a director of the New Haven's highway subsidiary, the New England Transportation Co. and was active in the formation of the Railroad Motor Transport Conference, which is to become the Motor Transport Division of the A. R. A.